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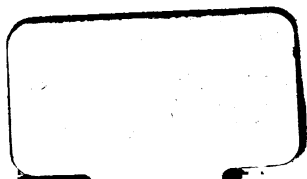
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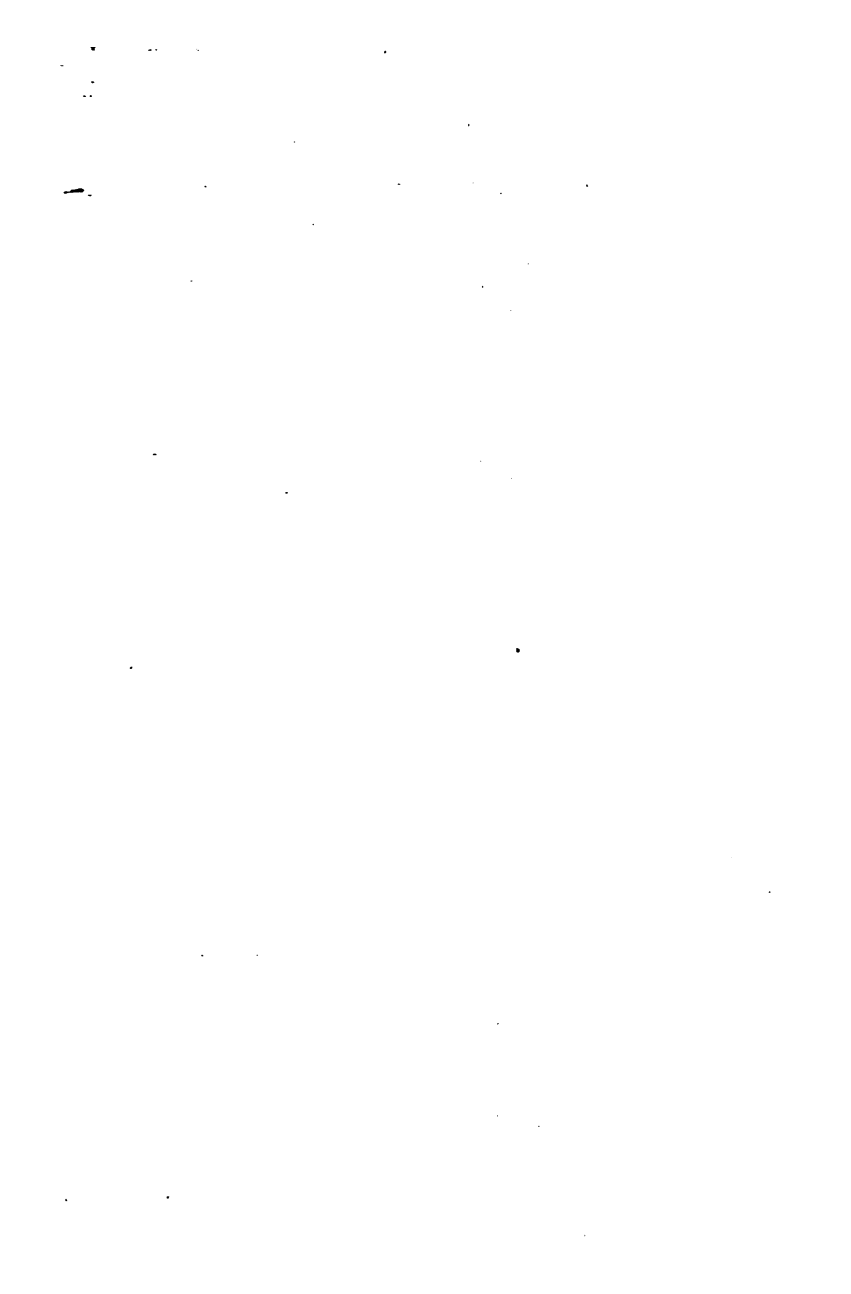
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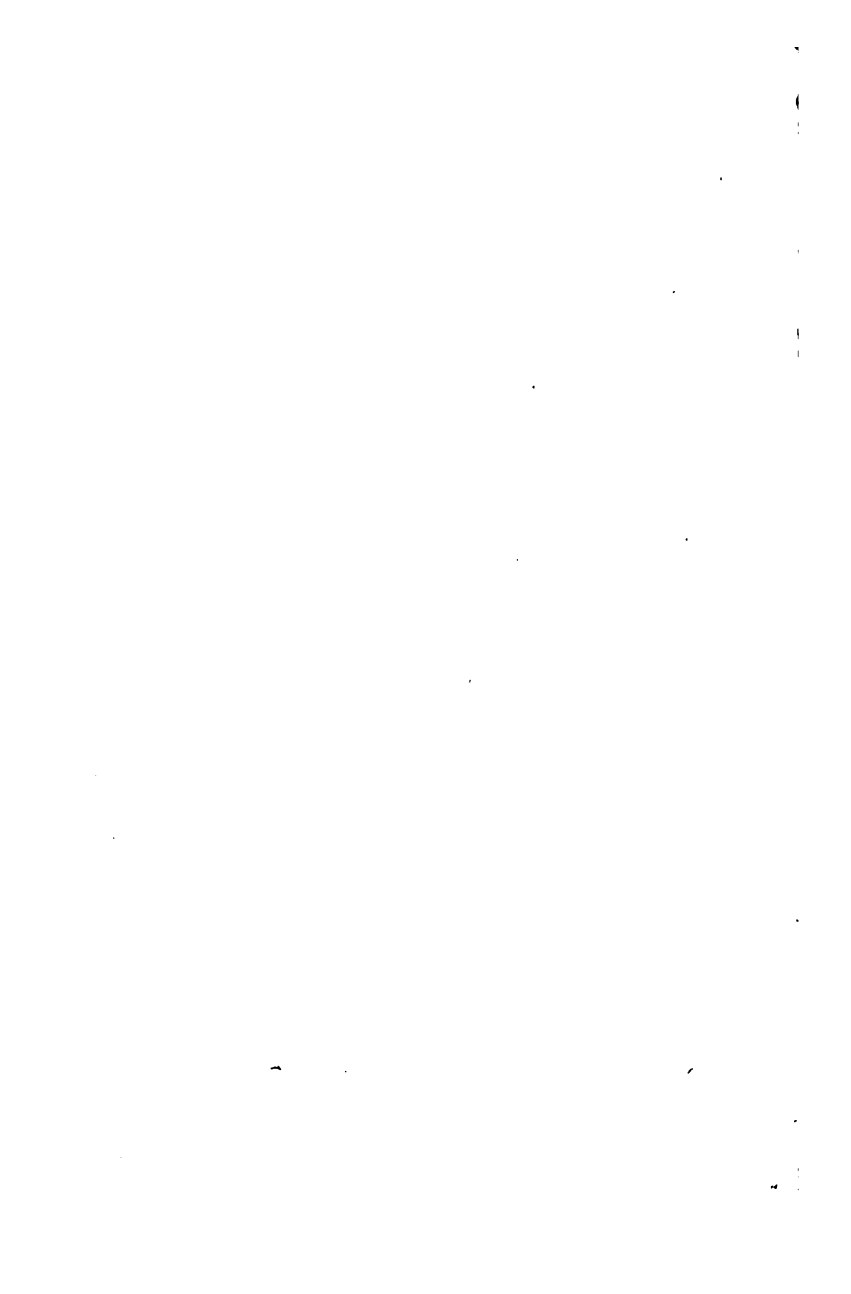
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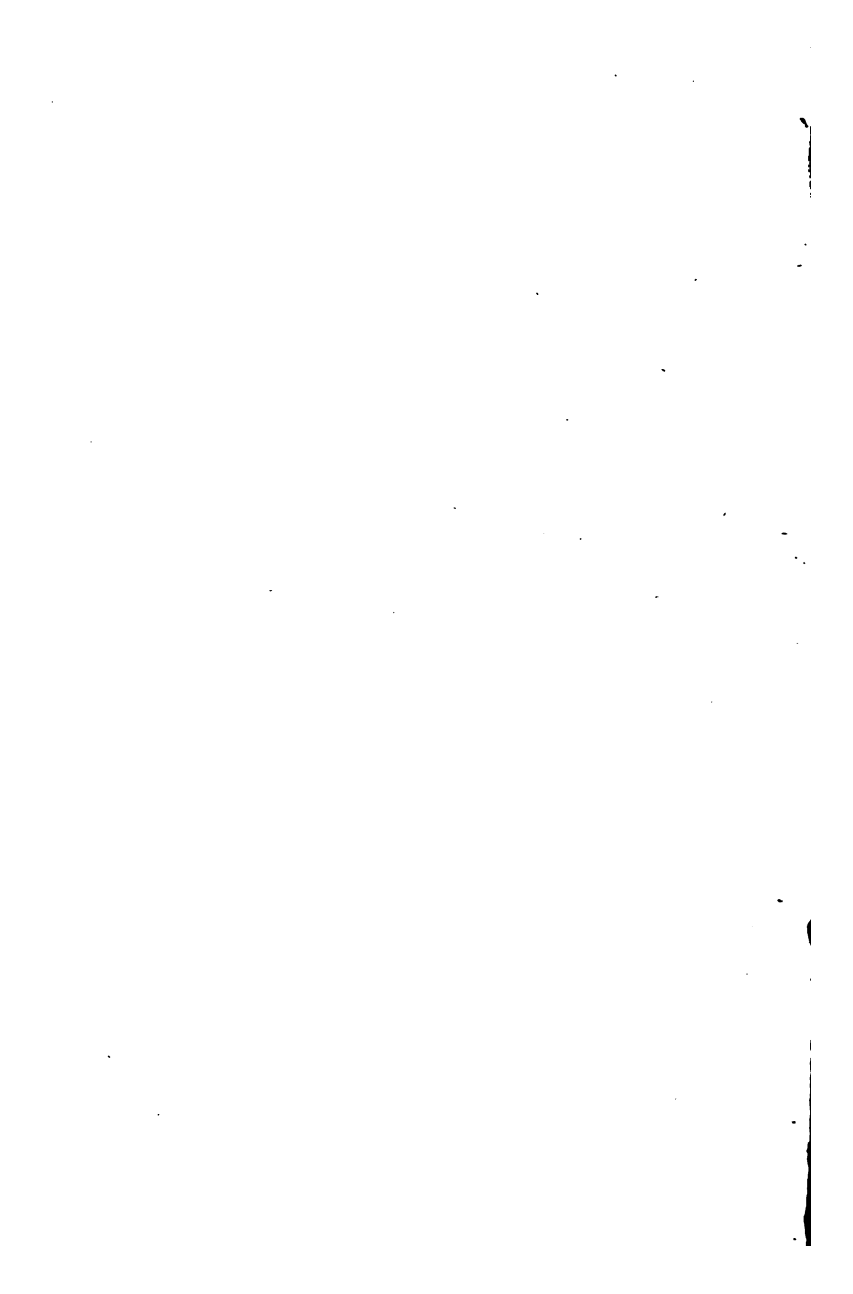




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THE
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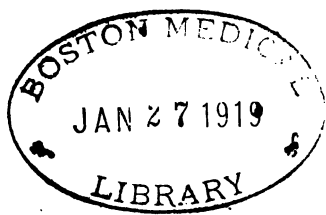


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PROFESSOR OF THERAPEUTICS AND MATERIA MEDICA, GLASGOW UNIVERSITY;
FORMERLY PHYSICIAN AND LECTURER IN CLINICAL MEDICINE,
GLASGOW ROYAL INFIRMARY

LONDON
J. & A. CHURCHILL
11 NEW BURLINGTON STREET
1885

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PREFACE TO FOURTH EDITION.

IN this edition the recent "recommendations of the Royal College of Physicians of London" with regard to the nomenclature of diseases have been as a rule adopted, and these have necessitated a considerable difference in the classification and arrangement. I have also thought it advisable to add much new matter, a Therapeutical Index, and rules for forming prescriptions both on the old method and on the metric system.

I trust that the increased size of the Manual will not deter medical students from accepting it as a "guide" when preparing for examinations; and it is to be hoped that the busy practitioner may find in its pages trustworthy information for the emergencies of practice.

I have to record my obligations to my friends Dr. A. Napier of Glasgow, Dr. Charles Davidson of London, and Dr. John Smith of Mauchline, for valuable suggestions while assisting me in seeing the work through the press.

M. C.

GLASGOW, *October* 1885.

PREFACE TO THIRD EDITION.

IN this Edition I have endeavoured to supplement the two previous Editions by additional details on important points, and to insert an account of some diseases formerly omitted. By using smaller type I have been enabled to do this without materially increasing the size of the book or altering the original plan. I trust it is still "handy" and practical.

I have to record my best thanks to Dr. Alexander Napier for valuable suggestions given to me, and for assisting me in seeing the work through the press.

M. C.

GLASGOW, *May* 1881.

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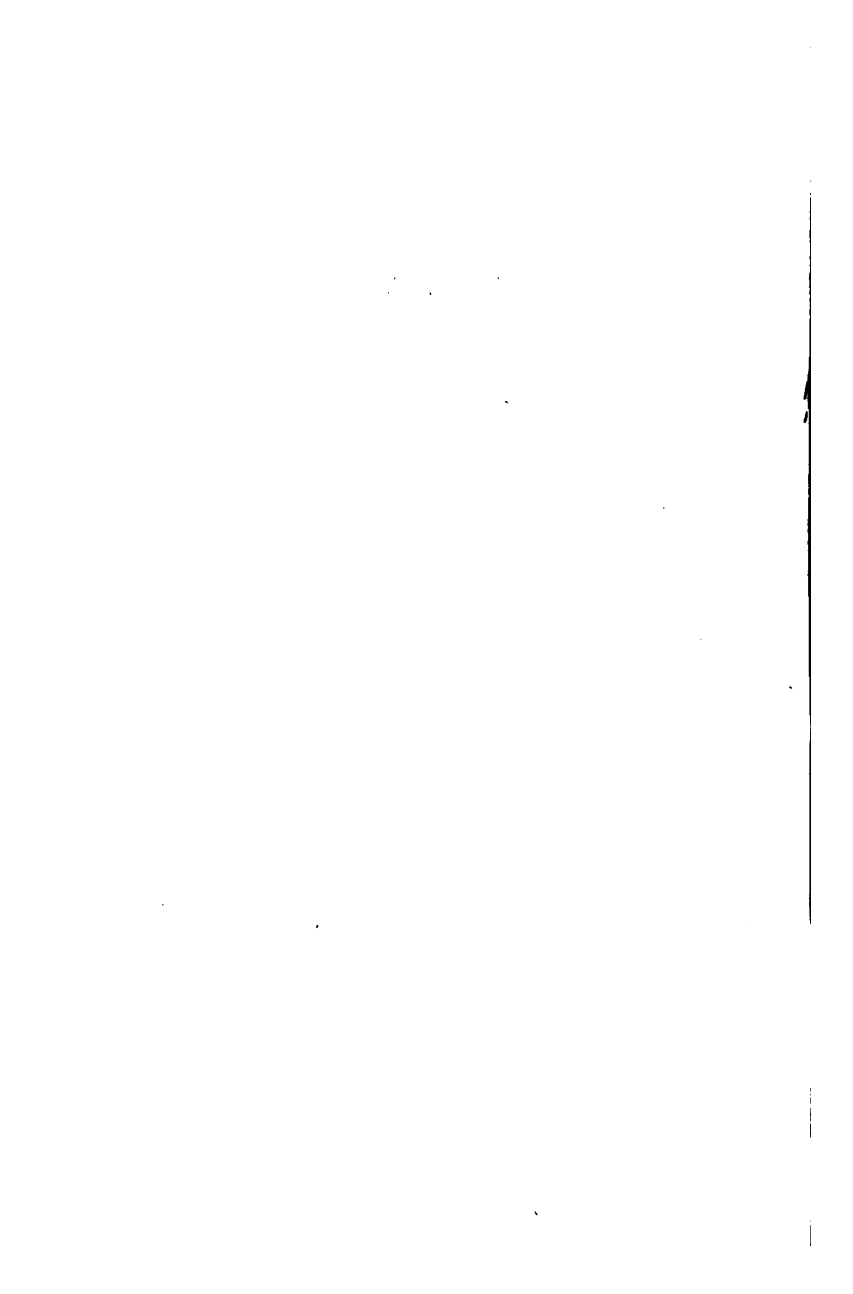
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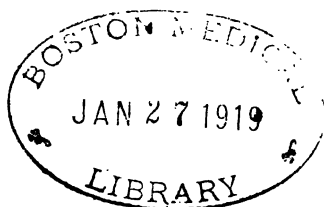
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GENERAL CONSIDERATION OF DISEASE

WITH

BEDSIDE HINTS.

WHAT is health? The answer to this inquiry can scarcely be given in the form of a definition, yet it requires no medical education to suggest a picture of what health is at the typical eras of human existence, when all the various functions of the human body are performed easily, naturally, and well. The healthy individual breathes without difficulty, the food taken is relished and properly assimilated, the blood is forced from its centre—the heart—onwards over the body, without valvular flaw or subsequent hindrance, and the brain, with its nervous expansion undisturbed by morbid fancies, controls the movements and the thoughts of the living organism. Disease is a deviation, to a greater or less extent, from what we thus realise, though we cannot define, as the standard of health. It may invade one or more of the systems we have alluded to, and it is the duty of the physician to find out, by the varied appliances of his art, what and where the disease is. Thus the student will perceive, what practical bedside experience teaches, that diseases are to be referred in many cases to certain systems—viz. respiratory, circulatory, digestive, integumentary, genito-urinary, and nervous. Each of these systems being liable to various diseases, and the allocation to one of these systems having been made, it is the

further province of the physician to ascertain, by a careful examination of the phenomena presented to him, what the particular disease which he is investigating may be. A little reflection or experience will, however, convince the student that all diseases cannot be brought under such a simple classification. There are certain diseases, by no means the least important, which, though presenting well-marked features during life, are found, by examination after death, not to have involved any one particular system. These must be called, for the want of a better term, General Diseases. The exact idea expressed by this will be better understood when these diseases are individually considered.

When we are called to investigate real or imaginary disease, the question presents itself to us, How is the nature of the disease to be determined? How is the inquiry to be prosecuted?

Pain is a prominent feature in disease, and important information may be obtained by asking—

“Where do you feel pain?” Follow this up by further inquiring—

“How long have you been ill?”

The patient in this way refers his pain to some particular part or parts, and tells the story of his illness in his own words, without any promptings on your side, which may be misleading. Now, with certain data to go upon, and with no preconceived, and therefore probably erroneous, ideas directing you, the systematic investigation can be justly commenced. If attention is directed to the chest, that region must be carefully explored by the three great means of Auscultation, Percussion, and Palpation. In order to facilitate inquiry, and to localise its evidences, the chest has been divided into certain regions, as the accompanying diagram will at once show; a fact which beginners should realise, not merely by looking at it, but by drawing the corresponding lines in ink on a friend or fellow-student's chest.

In Percussion the Pleximeter and Hammer may be used, or, in lieu of them, the first two fingers of the left

hand may be applied flatly to the chest, and struck with the tips of the corresponding ones of the right. Being already familiar with the sounds in health, you compare

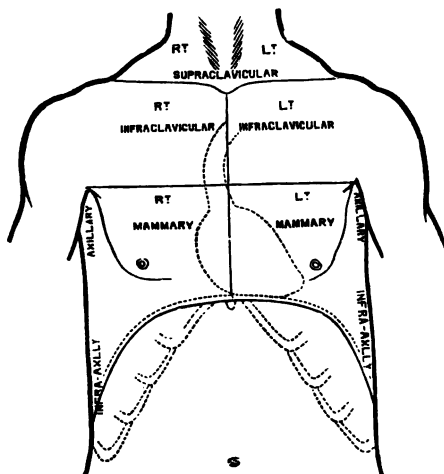


Fig. 1.

one region with the corresponding region on the opposite side, and note whether the sounds produced by percussion are healthy or the reverse, abnormally dull or abnormally clear.

Proceed in a similar way with Auscultation, by means of the Stethoscope, after carefully reading the chapter on Respiratory Sounds in Health.

Palpation, *i.e.* the application of the hand, shows the comparative movements of the two sides of the chest. It indicates also the vibration communicated to the chest wall by the voice, or what is called "Vocal Fremitus." Mensuration, by means of a graduated tape, reveals also the comparative size of the two sides, and in some cases, by special instruments, tells the actual and comparative movements of the chest in respiration.

But supposing your patient does not refer his complaint

to the chest, but to the stomach, then your inquiry must be directed primarily to the digestive system. Examine the tongue, ask as to his appetite and the state of the

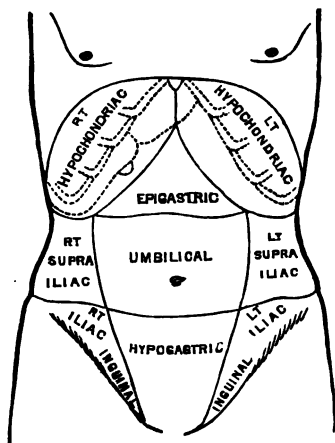


Fig. 2.

bowels. Percussion and Mensuration are now of great importance. The abdomen has also been divided by lines, as in the accompanying diagram.

If the patient refers his ailment to the kidneys or the bladder, your inquiry must be particularly directed to the urine, for this is the key-note to diagnosis. Note its colour, take its specific gravity, etc. (See chapter on Urinary Diseases.)

If he refers his complaint to the nervous system, try to discover from the symptoms presented what disease it may be, remembering that the brain is an aggregation of various parts, and that the means which assisted you before are now of little avail,—“For the brain you can neither see, nor touch, nor handle.” The subject is thus

beset with greater difficulty than in the case of the other systems mentioned.

It is a matter of great importance, in the method of examination thus suggested, to remember that one system cannot be long involved without implicating, to a greater or less extent, some, if not all, of the others.

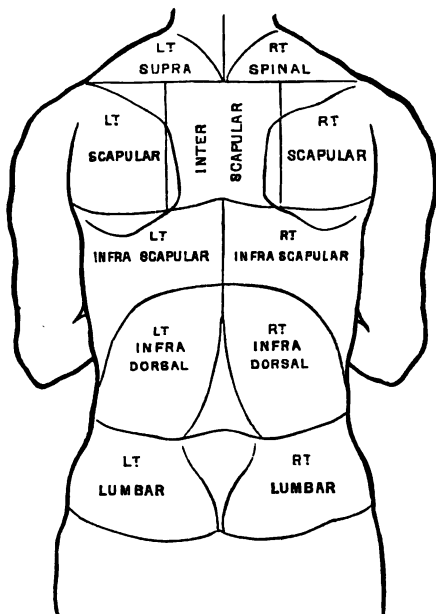


Fig. 3.

While special attention is of course paid to the system containing the organ primarily diseased, it is essential that the others should not be forgotten. It is immaterial in what order they are considered, but it is important that no one of them be neglected; and it is astonishing how, after a little experience, the student quickly and instinctively goes over them all.

Negatively, "General Diseases" may be remembered as not being brought under the systems mentioned; positively, they are associated with a constitutional state and have a history of their own. Under the head of "General Diseases" are included what are termed Zymotic diseases, or diseases which it is supposed can be prevented by attention to hygienic or other conditions. Zymotic diseases are distinguished by the following characters:—"They are all of them febrile diseases. They all run naturally a definite course in definite though different periods of time. They all present during some (usually definite) portion of that course certain distinctive spots, making eruptions on the surface of the body. As a rule, broken and proved by rare exceptions, they occur once only in the same person. Lastly, they are communicable from person to person by contagion, and arise in no other way.

"Small-pox, chicken-pox, typhus fever, typhoid or enteric fever, scarlet fever, the plague, measles, whooping-cough, mumps, constitute Zymotic diseases." (Sir Thomas Watson.)

In investigating these diseases it will be found that they appear to be propagated by some unknown though probably atmospheric influences, owning no general law, spreading over a wide area (epidemic), or peculiar to certain fixed localities (endemic). Under "General Diseases" it will thus be seen are numbered the various fevers, some of which seem the offspring of filth and the neglect of sanitary laws; while others depend on a specific something which is transmitted from person to person, probably through a disease-germ, and which through its specific character can originate only the disease from which it sprang.

Under "General Diseases" also are included various states of the body, in which the blood seems chiefly implicated, and which reveal themselves by local and constitutional and characteristic symptoms, as will be pointed out when individually considered.

The student, therefore, in forming an opinion with regard to diseases connected with the various systems,

or with regard to general diseases, will see that an important element in this opinion or diagnosis must be the causation, the etiology, of the disease in question. Is it peculiar to one country or to many? Is it a disease of youth or age? Is it hereditary, or is it acquired? Is it dependent on known or unknown agencies? Is it characteristic of sex or occupation?

Having thought these things over, having gleaned what he can also from signs, symptoms, and history, his further duty is to form a prognosis, a forecast of the probable issue. Will it be fatal, or the reverse? What complications may arise, and how may these be averted? These and all previous considerations have one definite object in view, viz. Treatment, specially directed to the person who is ill, but also in certain cases prophylactic, *i.e.* guarding against the extension of the disease to others, if that be possible.

The nomenclature of diseases and classification adopted in the following pages will be generally based on the recently published recommendations of the Royal College of Physicians, London (2d edition). Adopting this classification, a few remarks will first be made on morbid states and processes, as such, irrespective of the part or parts affected.

HYPERTROPHY.

Hypertrophy, considered as a sign of disease, is used to designate excessive growth, and may be "GENERAL" or "PARTIAL."

General hypertrophy is seen in individuals of extraordinary size who are denominated "giants." These persons are generally of feeble constitutions and deficient in procreative power.

Partial hypertrophy may mean excessive increase of any part of the body during the period of natural growth; or increase after a part is distinctly formed. Hypertrophy may be thus congenital or acquired. The congenital form may be seen in one arm or leg of the same side.

Acquired hypertrophy is dependent on a variety of causes, viz. increased work, pressure, inflammation, or physiological changes.

Hypertrophy, the result of increased work, is seen in the arm of the blacksmith, or the leg of the ballet dancer. The heart becomes hypertrophied when there is increased resistance to the flow of blood, either at the orifice of the organ, or the peripheral vessels.

Pressure moderate and intermittent of the hand leads to thickening of the epidermis, probably by an increase of the flow of blood. Inflammation when chronic tends to hypertrophy, thus the serous membranes, as the pleura, peritoneum, and dura mater, become thickened from chronic or repeated inflammation. The skin also in chronic eczema is thickened, and this condition may extend to the subcutaneous tissue.

Increased nourishment of a part combined with irritation or functional stimulus may originate hypertrophy, as in the cases of gastric and uterine derangements.

Physiological changes may cause hypertrophy of organs, as in the uterus by pregnancy, and the mammæ by suckling.

A question is asked in the process of hypertrophy, Does it depend on increase of the size of the minute elements of an organ or only on increase of their number? In most cases the multiplication of the tissue elements is the cause of the hypertrophy, but increase of the minute elements also occurs, as in the pregnant uterus, and the development of one kidney when the other has been destroyed.

By "false" hypertrophy is meant a process by which an organ becomes outwardly increased in size, owing to the deposition within it of some foreign material, or to mere distension. Thus the liver may be subject to "false hypertrophy" by the condition of fat. And emphysema of the lung increases the size of the organ, but at the expense of the true lung tissue, which is actually atrophied.

ATROPHY.

Atrophy is a term confined, as a rule, to cases where there is a slow but steady loss of flesh, and consequent impairment of health.

It is common at all periods of life. It is seen in infants under twelve months old, and is due then to unsuitable food, which causes vomiting, chronic diarrhoea, and wasting (marasmus). Tracing atrophy as years go on, we may say it is very often the result of INHERITED SYPHILIS. After twelve months and up to three years the child may be subject to RICKETS, and with this atrophy more or less marked is associated; after three years the mesenteric glands are attacked by TUBERCULAR DEGENERATION, and atrophy ensues.

After the fifth or sixth year phthisis may set in, and wasting. Atrophy in the adult is rarely seen as a distinct disease, but it is associated with phthisis, cancer, and many organic diseases of KIDNEY, LIVER, HEART, and LUNGS.

Atrophy may be local, *i.e.* a part of the body does not grow like other parts, and the condition is sometimes congenital and is evinced by arrested growth or congenital smallness. Sometimes there is a difference between the two sides of the body. Sometimes the arrest may show itself on one side only of the face. Sometimes, as in the cretin, the brain is stopped in growth.

Atrophy of parts may be seen at middle age as a physiological sign—the mammæ or testicles wasting.

By the term Acquired Atrophy is meant the condition associated with deficient blood supply to certain parts, as in the granular condition of liver and kidneys, through disease of the heart obstructing the circulation.

In two distinct diseases, both considered especially afterwards (pp. 399, 394),—progressive muscular atrophy and infantile paralysis,—loss of power in the muscles is associated with marked and rapid wasting.

Any interruption of the nervous channels, either above in the cerebrum or below in the nerve trunks, is followed

by degeneration ending in atrophy of the whole nervous tract leading from the cerebrum to the peripheral termination. This is the so-called **SECONDARY DEGENERATION** of the cord. In muscular tissue the wasting is almost as constant. Over-work from undue mental activity may produce degenerative diseases of the nerve centres, and excessive sexual indulgence may induce atrophy of testicles and ovaries.

HYPERÆMIA.

This means an excess of blood; and may be either "arterial" or "active hyperæmia," or "venous" or "passive hyperæmia." Arterial hyperæmia is due to the relaxation of the walls of the arteries and consequent enlargement of the vessels, or it may depend on increased flow of blood through the ordinary channels being interrupted, and is then known as "Collateral Hyperæmia."

Examples of "Direct Arterial Hyperæmia" are seen in the result of a blow, or by heat, or the reaction from intense cold; or it may be indirect through the vaso-motor nerves being diseased and losing their contractile curb on the vessels.

Examples of "Collateral hyperæmia" are observed when an embolus blocks up an artery, or when disease obstructs the chief arterial sources of an organ and leads to peripheral channels becoming hyperæmic, as in cirrhosis of the liver, granular kidney, and sclerosis of the spinal cord.

The symptoms of acute hyperæmia are redness, increase of temperature at the part, with swelling through the distended vessels, but not by exudation, which is characteristic of inflammation. There is also usually a sensation of heat in the part, or itching.

"Passive hyperæmia" may be due to feeble circulation or obstruction in the veins.

The action of the heart may be feeble—so feeble that there is not sufficient impetus to send the blood forward on its return current to the heart. In the erect posture this will be seen in swelling and congestion of ankles and feet; or in the recumbent position in the nates, sacrum,

and bases of the lungs (hypostatic hyperæmia). Cyanosis is the form of venous hyperæmia caused by imperfect formation of the heart, or as the result of certain diseased conditions of the lungs, as emphysema or chronic bronchitis.

Obstruction of veins may follow on a tumour, as in the swollen veins of the leg seen in pregnancy, or in the hæmorrhoids caused by pressure of hard fæces in the intestines. Venous obstruction due to disease of an organ may produce hyperæmia of the vessels supplying that part. Thus cirrhosis of the liver induces hyperæmia of the whole portal system. The symptoms of passive hyperæmia are evidenced in the veins being full of venous blood and producing a uniform purple colour. There is no throbbing and no unusual heat of the part.

Chronic hyperæmia leads, if continued, to transudation of serum and migration of red corpuscles through veins and capillaries. Internal organs are first enlarged, but owing to inadequate vascular supply and nourishment they become smaller and atrophy.

On external parts of the skin there is a tendency to ulceration, or liability to inflammation on slight causes. Thus eczema frequently arises.

HÆMORRHAGE.

Hæmorrhage (from *αἷμα*, blood, and *ῥήγνυμι*, I burst forth).

Hæmorrhage means the escape of blood from any part of the circulation, and its discharge from the body. Various terms applied to the escape of blood, denote the seat of hæmorrhage. Thus, bleeding from the surface of the body is simply called "hæmorrhage," and its exact source is otherwise defined. Hæmorrhage from the stomach is termed "hæmatemesis," and is most frequently due (1st) to ulcer or malignant disease of the stomach; (2d) it may result from congestion of the portal system, as in cirrhosis, chronic congestion and other diseases of the liver, or from diseased heart in mitral obstruction; pos-

sibly in this case the blood is derived from the amount of chronic gastritis accompanying this affection.

(3*d*) It may arise from a disease affecting the blood, and allowing it to ooze out through the walls of capillaries and veins, as in purpura and yellow fever or jaundice.

(4*th*) It may be vicarious, and evidence obstructed menstruation.

"Hæmoptysis" has its source in pulmonary or bronchial hæmorrhage, as from rupture or wound, active inflammation, mechanical hyperæmia,—secondary to heart disease or pressure of tumours from enlarged bronchial glands; softening of tubercular or malignant consolidation, as in phthisis or cancer; atheroma of the pulmonary artery; from bronchial capillaries; from the aorta or its great branches. Hæmorrhage from the ear, called "otorrhagia;" from the urinary tract, "hæmaturia;" from the anus, "melæna." "Menorrhagia" and "metrorrhagia" are terms employed to denote great bleeding from the uterus at the menstrual epochs of females.

DROPSY.

What is dropsy? To understand the description which follows it must be remembered that a certain amount of transudation of the serum of the blood through the veins is constantly going on in health. All closed cavities, all interstitial tissues, are kept moist during life by a continual serous exudation, which exudation again is as constantly and continuously absorbed—the absorbents being the lymphatic vessels. The continuous exudation and the equally constant absorption constitute the balance of health; but when this balance has been lost an accumulation of fluid takes place, and (dropsy) cedema is the result.

Should this accumulation occur in the subcutaneous areolar tissue, which it very frequently does, prominent and easily recognisable phenomena betoken its presence. The part so affected is swollen; the skin loses its natural colour; it becomes pale, and it may be tense and glazed.

If you press firmly with your finger over the pale, tense, glazing surface, you seem to knead a doughy mass, and an impress—"pitting"—is left corresponding with the amount of pressure made. This pitting is produced by the fluid being driven out of certain of the meshes of the subcutaneous tissue into those near it, and communicating with it; on the cessation of the pressure the fluid slowly returns, and the pit disappears. The pressure-mark, the "pitting" made, quickly disappears if the dropsy is slight, but if considerable and of long standing, the skin has lost its elasticity, and the process of obliteration is slow.

"Anasarca" is the technical term given to the accumulation of fluid in the subcutaneous areolar tissue; while "ascites" is reserved for the collection of serous fluid within the cavity of the peritoneum, and its recognition is more difficult, and may be simulated by other abnormal conditions. "Inspection," "palpation," and "percussion," will, however, establish the diagnosis. For "inspection" shows that the abdomen is swollen and full. "Palpation" gives a sense of fluctuation apparent to the touch when the patient is laid on his back or sits upright and a hand is laid flat on one side of the abdominal wall, while a stroke is made with the other on the opposite side. The wave of the fluid is also seen visibly to cross with the impulse given. "Percussion" evidences that, in obedience to the law of gravitation, there is absolute dulness at the flanks, while the centre gives a clear tympanitic note from the air-filled intestinal coils. "Percussion" will also reveal modifications of sound, in obedience to the same law, on the change of position of the patient; for if placed on one side, the fluid will gravitate to that, leaving the one uppermost free, and yield to the applied finger or pleximeter clearness instead of dulness as before.

This varying percussion sound affords a diagnostic sign to distinguish ascites from ovarian dropsy. For in ascites the percussion sound varies with every change of attitude on the patient's part; while in ovarian dropsy it does not, being limited to the side where the tumour is, and where

the history of the case evinces it had its origin; additional means for establishing a diagnosis will be afforded by the presence or absence of morbid changes in other organs, as heart, liver, or kidney.

It may be further remarked, that tympanites due to various causes may be confounded with ascites; but the percussion sound in the former is always loud and pronounced, both in front and sides. To distinguish it from distension of the bladder in pregnancy, the history of the case and the application of the catheter in the one instance, and the stethoscope in the other, are sufficient.

Should the effusion of the fluid be in the ventricles of the brain, or in the subarachnoid space, the term "hydrocephalus" is applied; when in the pericardium, "hydropericardium;" when in the pleura, "hydrothorax." The signs betokening its presence in these situations will be better understood in subsequent portions of this handbook. The term "œdema" is used when it is confined to one particular part of the areolar tissue.

The causes of the increased transudation of fluid constituting dropsy are two—

1st, Undue fulness of the veins, and consequent increased pressure on their walls.

2d, An abnormally watery condition of the blood, which gives rise to changes in the walls of the vessels, and renders them more easily permeable.

Dropsy arising from the first cause is designated "passive dropsy," as it always originates if the current of venous blood is impeded; that from the latter cause is known as "hydræmic dropsy."

"Passive dropsy" makes its appearance first on both sides of the dependent parts of the body—in the ankles and dorsum of the feet, disappearing at first during the night, reappearing during the day, when the patient leaves his bed, ultimately tending to become stationary, and mounting upwards to legs, thighs, genital organs, and the coverings of the chest and abdomen. To these symptoms, at a later stage, is frequently added effusion of fluid into the peritoneum, pleuræ, and pericardium. Thus it is

that passive anasarca occurs in cardiac disease through the venous circulation being embarrassed and engorged on account of the constant overloading of the right heart in mitral obstruction or regurgitation, and in the later stages of aortic disease. So also it appears in advanced emphysema, when the systemic veins cannot carry the blood into the overfilled right heart. The most common abdominal causes of venous congestion are diseases of the liver (cirrhosis and cancer), and of the peritoneum (tubercle and cancer).

In dropsy from the second cause, "hydræmia," the watery condition of the blood induces morbid alterations in the structure of the vessels, by which exudation of the serum of the blood is permitted to an abnormal degree. On what does hydræmia depend? Either on an impoverishment of the blood in respect of albumen or fibrin, or on retention of water in the circulation from arrest of perspiration, or diminution of the secretion of urine.

Notably in acute and chronic diseases of the kidney is the blood found to be poor in albumen, and it is in these affections that we observe especially dropsy from "hydræmia," aggravated, when the heart is also hypertrophied, by increased blood pressure within the vessels.

Dropsy from "hydræmia" is also observed in many chronic exhausting diseases (phthisis); and when the blood is poor through bad or insufficient nourishment (purpura or scurvy). Although it may be generally said that dropsy is a concomitant, a symptom accompanying any affection which impoverishes the blood, yet there are three great kinds of dropsy, which are named after the organs implicated—CARDIAC, RENAL, and HEPATIC.

Cardiac dropsy, dropsy due to disease of the heart, commences in the FEET and HANDS, and mounts upwards, ultimately becoming diffused all over the body.

Renal dropsy shows itself first in the FACE, especially in the LOWER EYELIDS, which become puffy and swollen, and in its earlier stages has a tendency to shift to other parts, *e.g.* the backs of the hands.

Hepatic dropsy is localised, at first being confined to the

PERITONEAL CAVITY. The portal system of veins is at first alone implicated ; and hence the legs, feet, and hands may not give evidence of dropsy for some time—in fact, until the venous current in the inferior vena cava is also impeded. In an adult man primitive ascites is diagnostic of disease of the abdominal organs, generally dependent on cancer or cirrhosis of the liver.

Dropsical fluid presents the following characters :—It is thin and watery, generally of a pale straw colour, and having a specific gravity of 1008 to 1014. Its reaction is usually alkaline. It is allied to blood serum in this, that it holds in solution albumen and alkaline and earthy salts, notably the chlorides. The proportion of solids is, however, much less, and the albumen, especially, varies in quantity.

Treatment.—Without entering specially into the treatment of the different kinds of dropsy, it is to be observed that there are obvious indications—

1. To remove the fluid ; 2. If possible to prevent its recurrence ; and if neither the one nor the other is possible palliative measures are necessary.

Rest in the recumbent posture is of paramount importance, and the part in which is the greatest effusion must be elevated and supported. For this end raise the anasarcaous limb, and support the distended scrotum.

There are three great channels for getting rid of the effusion—the skin, the kidneys, and the intestines ; and if the remedies employed to eliminate it by these organs fail, then tapping or puncturing must be had recourse to (F. 33, 37a, 27).

INFLAMMATION.

The old definition of inflammation by Celsus was thus expressed—

“Notae Inflammationes sunt quatuor, rubor et tumor, cum calore et dolore.”

These are cardinal signs, but they do not explain the exact causes, and inflammation may therefore be defined

as a series of changes in a part, identical to those produced in the same part by injury ; and by injury is meant a chemical or physical irritant.

Tissue change thus underlies inflammation, and Whence is this tissue change ? Does it emanate from the tissue itself, or is it the result of other causes being intruded upon the tissue ? The answer to these questions is best solved by looking at what occurs when inflammation is set up in a part which can be carefully and microscopically examined during the inflammatory process. Thus, if the mesentery or the tongue of a frog is drawn out and placed under the microscope, inflammation occurs, and the tissue element may for hours be under observation.

What is then seen as the earliest change is dilatation, first of the arteries, then of the veins, the capillaries being little affected.

This dilatation is associated with quickening of the blood stream, which lasts for a varying time, and is followed by retardation. The blood current becomes slower and slower, and at last the stage of STASIS is reached, and remarkable phenomena are now seen in the circulation, especially of the veins. The red corpuscles and leucocytes in non-inflammatory conditions move on together in the blood-current, occupying a central position. But in inflammation the leucocytes lag in their course. They attach themselves to the margin of the vessel, and form a marginal layer. But this is not all ; as stasis becomes more developed the leucocytes pass through the vessel, and the passing through is observed first as a small projection, on the outer layer, attached by a narrow stem. This attachment is finally broken, and we see a colourless contracted body with one long process and several shorter, with one or several nuclei—in fact a LEUCOCYTE.

In process of time the outer surface of veins and capillaries, but not of arteries, shows several rows of leucocytes, evincing that emigration is not solitary but in numbers.

Accompanying the leucocyte emigration is a NIDUS, on which they can nestle, and this is known as an "Exuda-

tion." This in the exposed mesentery of the frog reaches the surface; and it forms the layer of false membrane seen in inflammation of serous surfaces.

Without detailing the experiments by which Cohnheim arrived at his conclusions, we may state that the migration of leucocytes and exudation, the result of stasis, are connected not with the blood or the cells, but are due to degeneration of the walls of the vessels.

But the migration of the leucocytes to their new quarters is not stationary. They multiply and increase, and form new cells, in the tissues they have invaded; and in this they are to a certain extent aided by the fixed cells of the tissues, which germinate and produce fresh elements.

The results of the exudation products are **SERUM**, **MUCUS**, **FIBRIN**, which by combination with leucocytes form lymph and pus. New growths take place from the vessels, in the form of vascular connective tissue, which in some cases assumes the special form of **GRANULATIONS**.

The exudations poured out, as the result of the inflammatory process, on serous and mucous membranes, differ in their terminations. In serous membranes they always coagulate. In mucous membranes they do not, as a rule, and probably this is due to some action of the epithelium; when, however, the epithelium is removed, a fibrinous layer follows, and the same result ensues from the application of a powerful irritant, as in croupous inflammation.

The product called **INFLAMMATORY LYMPH** consists of coagulated fibrin and entangled leucocytes, in varying proportions.

The inflammatory exudation, when the corpuscles greatly predominate, and the intermediate substance is liquid, is termed **PUS**.

The corpuscles of pus, fresh and newly formed, cannot be distinguished from leucocytes of the blood, for they exhibit active wandering (amoeboid) movement, and continual change of form. When they develop in any

quantity and accumulate and form an abscess, their wandering movements cease ; they become dead.

In the formation of the abscess it is presumed that the tissue cells take an active part. The difference of tissues in which inflammation exists gives rise to various kinds of inflammation, to which distinctive names are given. Thus—

1. "Catarrhal." On mucous membrane the exudation is not coagulable. It contains only detached epithelial cells and a few leucocytes.

If, however, catarrhal inflammation is very severe, it becomes purulent, as in the specific inflammation seen in virulent conjunctivitis and gonorrhœa.

2. "Croupous or Fibrinous." "Croupous" inflammation is that form in which coagulable exudation is formed upon a mucous surface. "Diphtheritic" inflammation is more than this, for it expresses some death of mucous membrane, as well as exudation on the surface.

The fibrinous form may be regarded as the usual kind of inflammation of serous membranes and connective tissue ; and the term "croupous" is applied to certain inflammations, as in the lung, *e.g.* "Croupous Pneumonia."

3. "Parenchymatous." This name has been given to the inflammations occurring in special tissues of organs independent of connective tissue framework.

4. The inflammation of connective tissue framework is termed "INTERSTITIAL," which again has subdivisions, as—

- (a) Phlegmonous inflammation — acute interstitial, leading to abscess.
- (b) Indurative inflammation, in which new connective tissue is produced in the interior of organs. This is chronic interstitial inflammation.
- (c) Degenerative.
- (d) Scrofulous. In this case inflammation, owing to a peculiar cachexia of those affected, is readily induced and heals slowly.

5. "Infective inflammations" are derived from pre-

existing inflammations in which infective materials are carried by the blood. Pyæmia is a type of infective inflammation.

6. "Chronic." Inflammations are termed "chronic" when they do not tend to resolve but remain stationary. Chronic inflammations on mucous surfaces are distinguished by the persistence of a condition in the vessels, which permits exudation and cell formation.

In serous membranes chronic inflammations produce fibrous adhesions, with little or no liquid exudation. In interstitial tissue of solid membrane chronic inflammations cause at first enlargement and afterwards contraction of the tissues, making them waste and diminish in bulk. This is the degeneration observed in cirrhosis of the liver and of chronic parenchymatous inflammation of the kidney.

DEGENERATION.

This term is used in Pathology to express the condition in which a tissue or substance becomes replaced by some other tissue or substance less highly organised, different in composition, and more unfit for the performance of its original functions.

This change may be effected by chemical metamorphoses, as of albuminous into FATTY material; by infiltration of the tissues with some new material, as ALBUMINOID; or by the substitution of a newly formed tissue, inferior to the original in organisation or efficiency, as in FIBROID degeneration.

The following kinds of Degeneration are recognised by Pathologists:—Albuminoid, Fatty, Mucoid or Colloid, Parenchymatous, Calcareous, Pigmentary and Fibroid.

1. ALBUMINOID (*Synon.* Waxy, Lardaceous, Amyloid Degeneration).—This degeneration is associated with exhausting diseases, where purulent discharges, long continued, weaken the strength of the patient; or where a former disease has deteriorated the constitution, as

syphilis or ague; or some more obscure cachectic condition.

The organs affected are chiefly the liver, spleen and kidneys, lymphatic glands, intestinal mucous membrane, especially the villi; more rarely the suprarenal bodies, pancreas; exceptionally the thyroid body and generative organs.

The organs affected are generally increased in size, and in advanced cases present a peculiar blanché appearance, like beeswax. If the tincture of iodine is applied to organs with albuminoid disease, a brown-yellow or mahogany colour is the result. A further change is occasioned if the iodine-discoloured parts are treated with dilute sulphuric acid—then a purplish-black colour forms. These changes are due to the existence in the tissue elements of a peculiar substance allied to the albuminate, and containing, when approximately pure, about 15 per cent of nitrogen. Virchow erroneously considered the change, from its characteristic colour when acted upon by iodine, as due to starch; hence the term “Amyloid,” still retained in Pathology. See Waxy Kidney, p. 339.

The general symptoms of albuminoid disease during life are failing health, waxy appearance of the face, general debility.

In the case of the liver there is detected uniform smooth enlargement; and in the kidney the albuminuria and dropsy are of so peculiar a character as to distinguish this form from other chronic diseases of the organ.

2. FATTY DEGENERATION.—In fatty degeneration the organ is increased in size; the consistence is reduced, sometimes, as in the brain, to a pulpy state—the colour being changed to a yellow or buffy hue. When cut into a greasy stain is left on the knife, and in advanced cases, as in liver disease, a portion of the organ thrown into water will float.

The microscopical character of this degeneration, as seen in the heart and walls of capillaries, are first loss of

sharpness of individual muscular striæ, and the appearance of minute quantities of oil between the elements. When the process is advanced the whole of the fleshy substance is replaced by fatty particles, contained in an albuminous envelope. Finally the degenerated fibres become atrophied through absorption of the fat; or suffer rupture, with discharge of their contents.

In "white softenings" of nervous tissue the nerve cells and the nuclei of the part are converted into granular corpuscles; and when these break down into a fatty condition a creamy consistence is assumed.

It was at one time supposed that the fatty change was due to the blood depositing oily materials, but later investigations, especially of Dr. Quain, have conclusively shown that the nitrogenous materials of the tissues themselves, and not the blood, are the "*fons et origo mali*," and further are dependent on interference with nutrition, and especially with the process of oxidation.

3. COLLOID or MUCOID DEGENERATION.—This degeneration is associated with a peculiar morbid product resembling glue or jelly, and is observed in some forms of cancer or new growths. It is more particularly referred to under Cancer, page 116.

4. PARENCHYMATOUS or GRANULAR DEGENERATION, also called "CLOUDY" SWELLING, is a peculiar change met with in some epithelial structures, especially the liver and kidney cells, and occurring in connection with some diseases of organs in typhus, typhoid fever, scarlet fever, diphtheria, and pyæmia. The naked eye appearance is like that of fatty degeneration, but it is distinguished from this by the SOLUBILITY of the GRANULES in ACETIC acid, and their INSOLUBILITY in ETHER. This degeneration is supposed by some authorities to be due to the high temperature observed in the diseases mentioned, and by others it is simply regarded as dependent on post-mortem changes.

5. CALCAREOUS DEGENERATION.—This degeneration

partakes more of the nature of an infiltration than degeneration, for the normal tissues are infiltrated with the deposition of calcareous particles, while there may be no alteration in the tissues themselves, except what exists from the infiltration retarding the circulation or growth of the parts affected.

6. **PIGMENTARY DEGENERATION.**—This is observed in the pigmentation of the spleen after intermittent fever, and it is also seen in chronic serous congestion following a fibroid degeneration.

7. **FIBROID DEGENERATION.**—This is the result of chronic interstitial inflammation, as the result of which the original tissue is replaced by a form of connective tissue. It is first observed that cells of a lymphoid type penetrate the tissue and become slowly organised. This ultimately leads to induration, contraction, and partial atrophy. Fibroid degeneration is further referred to under Diseases of the Lungs, page 195.

FEVERS.

We now take up the first great class of diseases—viz. Fevers, of which Graves says, “In the whole range of human maladies there is no disease of such surpassing interest and importance as fever.” The knowledge of fever in the abstract is essential for the proper treatment of all diseases, and hence it is, doubtless, that the literature of fever is so varied and voluminous.

The old physicians said—“*Essentia vero febrium est præter naturam caliditas.*” And they were led to this definition by feeling the skin, which they recognised to be warm—warm above the natural temperature of the body—warm above what is consistent with health. In late years we have been enabled to estimate more accurately than they did this increased warmth, by means of the clinical thermometer, which may be placed in the

rectum, vagina, mouth, or axilla. For obvious reasons the latter is the site generally chosen. If the bulb of the thermometer is placed in the axilla, and kept there from ten to fifteen minutes, it will be found in health to register 98.6° F., or if it is placed in the rectum or vagina, it may rise to 99° F., or even a little higher. Certain circumstances may occasion a variation from the points mentioned, and yet health may be retained. What circumstances are these? *1st*, Long exposure to great heat or cold. *2nd*, Climate. The average temperature in tropical climates is greater than in temperate; *e.g.* it may reach 99.5° or even 100° Fahr. *3rd*, Food and drink. After a full meal the temperature first falls, then it increases as digestion goes on. Fasting lowers the temperature, and the taking of alcohol first causes a fall which does not last long, for it requires a considerable amount to have any material influence. *4th*, Exercise also increases, while prolonged study causes a slight depression.

Aware of the existence of these circumstances, and bearing them in mind, the student may confidently assume that if these conditions do not exist, and yet the temperature remains persistently above normal, he has then undoubtedly to do with the state called Fever. It must be remembered, however, that increase of temperature is associated with many of the acute affections subsequently to be considered; and the student must not *ipso facto*, from mere thermometrical indications, and without carefully weighing probabilities, consider that he has to do with one or other of the continued fevers. In fever, as in all acute diseases, the temperature should be carefully taken morning and evening, and in hospital a chart, containing the daily result from the commencement, hung up in a convenient situation near the bed.

In accordance with what has been stated, Virchow's definition of fever is the best, as it is the shortest—viz. "That it is that state of the body in which there is an increase of temperature above the normal."

Acknowledging Virchow's definition of fever as the best,

the question may now be asked, Why is there an increase of temperature? Facts seem to show that it is connected with the loss of nervous control, which in health guards the oxidation of tissue. This control is in abeyance, but in what manner is still a matter of hypothesis, although it may be fairly assumed that bacilli enter the blood and affect nervous centres, or fever may originate by disease directly operating on these centres. These two suppositions are supported by the facts that discharges from wounds—the results of surgical operations—may be absorbed into the system and induce fever, while injuries to the nervous centres—the results of blows or falls—may cause an increase of temperature even without external open wounds. The balance of health in both cases is changed, and fever commences, as thermometric evidence plainly reveals. The treatment of fever will be alluded to afterwards, under the several diseases in which it manifests itself. Still, speaking generally here, it may be stated that the first object of treatment is to remove the cause; and secondly, to act on the fever by methods which reduce the temperature. These latter methods are various, and have changed greatly with the advance of our knowledge in therapeutic measures. Old medical works testify how freely in fever venesection was practised, when the bodily heat rose above the normal. Now blood-letting is practically abandoned, and other and less heroic methods are put in force. Thus purgatives are useful at the outset, and so also are diaphoretic and diuretic remedies. These act favourably by removing the increased products of tissue waste, and promoting by perspiration a healthy action of the skin.

Of special measures may be mentioned the cool and cold bath. The "cool" bath may be employed at a temperature of 70° to 80° Fahr., in great hyperpyrexia in typhoid fever; the "cold" bath is essential in some forms of rheumatic fever, or in injuries to the brain.

Some alkaloids have the power of checking fever. Without discussing the physiological causes explaining this, it may be stated that quinine notably effects reduc-

tion when given in large doses as ten, twenty, or thirty grains, in twenty-four hours, by the mouth or hypodermically. Salicin and salicylic acid, unless the heart is implicated, specially check rheumatic fever.

Aconite seems to have a different action from quinine and salicin, for it antagonises the fever by depressing the circulation. In the early stage of catarrhal fever—the result of a chill—or of local inflammation, the administration of tincture aconite, in minim doses every five minutes, until 30 minims have been given, markedly promotes improvement.

In pneumonia or enteric fever, when the disease is fully established, although quinine may be given, aconite is contra-indicated, for its action directly goes against the great object of treatment, viz. supporting the constitution until a crisis or lysis is reached.

In this country there are four kinds of continued fever—

1. Simple Fever or Febricula.
2. Typhus.
3. Typhoid.
4. Relapsing.

SIMPLE FEVER or FEBRICULA is non-contagious, and depends frequently on errors of diet, exposure to the sun or cold, or other insanitary agencies which may fatigue or weaken the system.

Symptoms.—Following on one or more of these causes, without almost any warning, the patient becomes languid and disinclined for either mental or bodily work; the appetite is lost, and headache ensues; a dull aching pain is felt all over the body, especially at the back, accompanied with “a creepy cold sensation” difficult to define.

This creepy cold sensation is followed, in the course generally of a few hours, by increased heat of body (fever), rapid pulse, furred tongue, and scanty, high-coloured urine. Delirium through sleeplessness may supervene, and the state of matters may seem very alarming, when, after an interval of three or four days, there is a crisis. The pulse

falls, the skin becomes moist, thirst abates, headache ceases, and a copious perspiration terminates the fever. The patient is left weak, yet convalescent, and the strength gradually returns.

Diagnosis.—By exclusion of other exanthemata as the cause of the rise of temperature, no vomiting, no pain of back as in small-pox ; no sore throat as in scarlatina ; no sneezing or cough as in measles. Stethoscopic examination does not reveal anything wrong with the chest. Sudden onset excludes typhoid, and if no epidemic of typhus exists that fever also is absent. It may be added that its division into "catarrhal," "bilious," "mesenteric," and "brain fever" seems unnecessary.

Treatment.—The indications for treatment, since the fever terminates in recovery, may be summed up in a few words. At the commencement give a saline purgative of sulphate of soda and sulphate of magnesia, or a Seidlitz powder. After the bowels have acted, employ a diaphoretic or diuretic mixture ; or 1 minim doses of tincture of aconite may be given every five minutes in water until 30 minims have been administered (F. 31, 40). A tepid bath, or placing the feet in mustard and hot water, may hasten the crisis of simple febricula. The patient has no inclination for solid food, and should not be urged to take anything but a sloppy diet, as arrowroot, milk-gruel, etc. Convalescence is to be assisted by nourishing food, such as beef-tea, chicken-soup, and wine. A tonic mixture is also serviceable (F. 75, 76, 77).

To understand properly what is to follow, it may not be out of place to give a short historical account of the two great continued fevers of this country—*typhus* and *typhoid*. Formerly the word "typhus" included a group of diseases, but as morbid anatomy became more studied, it was attempted to explain typhus by an anatomical definition. This was especially the case in France at the beginning of the present century ; it being found that cases like typhus presented characteristic lesions in the ileum and mesenteric glands. It was therefore supposed that all cases of typhus would show these characteristic

lesions, and much disappointment ensued when it was discovered that there were instances of typhus which a post-mortem examination failed to explain. So, gradually, French and English physicians were reluctantly compelled to admit that the cases seen must belong to different categories. And hence it became necessary to use the term typhoid (like typhus), and although objections may be urged against its employment since the diseases differ so materially in their symptoms, progress, and terminations, yet it is doubtful if a better one can be established without being open to grave theoretical objections. For its other synonym, "enteric," conveys the impression that the inflammation of the intestine is the cause of the fever, whereas in point of fact it is the result. So also "pythogenic," as applied by Dr. Murchison, implies that putrefactive changes, simply as putrefactive changes, can produce the fever—a conclusion which many deny.

Although the controversy which so long raged has now been practically settled, it seems impossible to doubt that these fevers presented distinctive characters from the earliest ages, although their anatomical differences and clinical history were only elucidated in recent years. For it can scarcely be supposed that typhoid did not exist as well as typhus long ago. Its non-detection is probably due to the looseness and the carelessness displayed in recording the results of pathological observations. All intestinal ulcers were at one time classified under the term Dysentery, and very probably typhoid epidemics were simply treated and styled dysenteric epidemics. In the seventeenth century descriptions of cases, with accounts of post-mortem examinations, leave little doubt that typhoid fever was then widely spread in Europe. Such reports were given by Spigelius in Italy; by Willis and Sydenham in England; by Hoffman in Germany. In the eighteenth century its existence can be proved with certainty, for Morgagni describes a case with ulcers and perforations in the ileum and beginning of the colon, with swelling of the mesenteric glands and of the spleen. So also, other cases were reported with more or less minute-

ness, until, at the beginning of the present century, the French described epidemics of typhoid fever with constant intestinal lesions.

It was reserved for Bretonneau of Tours, in 1820, to prove that the disease was always localised in the solitary and agminated glands of the ileum. He also was the first to maintain that it depended on the action of a poison, which was communicated from the sick to the healthy; and, carried away by the discovery, he and subsequent French observers deemed it identical with the contagious typhus seen in camps and following armies. Then there came to be a wide division in the views of French and English pathologists—the former rarely failing to find the intestines diseased in continued fever, while the latter saw them healthy, and regarded the intestinal lesion as a mere accidental complication. So the controversy raged for some years, and it appeared puzzling to candid inquirers how eminent and truthful observers should record such seemingly discordant facts.

For it would appear clear, either that the intestine was diseased, or that it was not. It was or it was not the seat of ulceration. In 1835 Dr. Perry of Glasgow very nearly guessed the whole truth that the fevers were essentially distinct, though he admitted that the one might pass into the other. He was followed by Dr. Lombard of Geneva, and Messrs. Gerhard and Peacock of Philadelphia, who stated “that the distinctive characters of the two diseases were such as in practice could not allow them to be confounded.” In 1841, Louis, in his great work on typhoid fever, admitted “that the typhus fever of the English is one very different from the one he is now describing—viz. typhoid.” Notwithstanding this, the doctrine of non-identity did not remain unopposed, for different schools propounded different doctrines.

Much of the remaining doubt was, however, dispelled by the researches of Sir W. Jenner, published between 1849 and 1851. Not merely did he state the differences observed during life, but by an analysis of carefully recorded cases he showed the distinctive post-mortem

features of typhoid. He also demonstrated that the two fevers were dependent on different causes, that the one did not communicate the other, and finally concluded by stating "that typhus and the so-called typhoid fever were as distinct as any of the exanthemata"—an opinion which all subsequent observations have tended to confirm.

After these remarks we now take up the separate consideration of the different fevers, commencing with

TYPHUS FEVER.

This fever was, as has been indicated, formerly called putrid, pestilential, ship, or hospital fever, and it derives its name from the Greek word *τυφος*, smoke. This fever is contagious, usually epidemic, and most frequently follows, or is the direct result of, destitution, overcrowding, and bad ventilation. It is eminently a disease of the poor.

Symptoms.—The fever poison having been absorbed into the system, there is a period of incubation of from one to twelve days, during which time the patient feels out of sorts, with pains in his limbs, languor, loss of appetite, headache, thirst, and the "creepy sensation" formerly alluded to. These are succeeded after a varying interval by increased heat of skin, full and rapid pulse, restlessness, apathy, great thirst, and prostration. The patient no longer fights against his malady, but willingly keeps his bed.

Is there anything particularly characteristic of this fever?

There is what is termed the typhus rash, somewhat dark and mulberry-like in appearance. It consists chiefly of irregular spots, sometimes single and easily defined, at other times patchy from a number of them coalescing. They are most frequently seen on the chest and abdomen, rarely on back or face, and at first disappear on pressure. Their dark colour fades after a day or two into a brick-dust hue or mottling, which appearance increases until the rash becomes ecchymosed or hæmor-

rhagic, and in this later stage does not disappear on pressure, but remains permanent even after death, or until recovery ensues. The rash comes out ONCE FOR ALL (not gradually), from the fifth to the eighth day of the fever, and is rarely absent in adults, although in young children it is not so frequently observed. In addition to this rash characteristic of typhus fever, there is also peculiar to it a dull, heavy, stupid expression of countenance. The eyelids droop, and the eyes have the appearance of those of a man recently recovered from a debauch.

With the fever there is generally delirium. This rarely comes on before the end of the first week, and usually continues until death or convalescence supervenes. The delirium is of a violent and painful character, and at first is not continuous. The patient can be roused to answer questions, take drinks, or show his tongue. Yet his expression is vacant, and he mutters when alone. Generally this stage is succeeded by a loss of cognisance of external objects, and by various delusions, especially during the night. The patient tosses about from side to side, or he may shout madly, or endeavour to get out of bed. The mind is, in one word, thoroughly unhinged.

The pulse increases in rapidity, and at the same time gets more soft and feeble. The temperature rises in the first week to 104° or 105° , remaining about these points for a week, and then subsiding to the normal or sub-normal about the end of the second week.

The tongue becomes dry, brown, tremulous, and is protruded with difficulty, while the teeth and lips are covered with sordes, emaciation all the time going on, with tendency to contraction of the pupil, cold extremities, and congested conjunctivæ. In favourable cases the disease usually terminates on the fourteenth day from the commencement of the fever by a "crisis," which is ushered in by profuse sweating, a prolonged sleep, or diarrhoea; or more rarely there is no marked crisis, but rather a gradual subsidence of pulse and temperature ("a lysis.")

Should a fatal termination ensue, it usually happens

between the twelfth and the twentieth day of the fever, death being preceded by great prostration, picking of the bedclothes, *subsultus tendinum*, involuntary passing of fæces and urine, and coma. The mortality is about one in five of those attacked, and the greater the age above ten years the greater the danger.

Complications.—Typhus may be complicated by the occurrence of acute bronchitis, pleurisy, or pneumonia, rarely by affections of the larynx or pharynx. The heart is sometimes softened, especially the left ventricle, and this gives rise to depressed action of the organ, and a loss of the first sound. At other times the sounds are well developed, and are accompanied by a vigorous and heaving impulse indicating over-excitement of the organ without softening. Other complications are gangrene of the extremities, bed-sores, very rarely diarrhoea—the bowels all through the disease rather being constipated.

Diagnosis.—The rash and the nature of the fever distinguish typhus from any inflammatory condition of the lungs. Its further diagnosis from typhoid will be alluded to afterwards. Acute meningitis, for which it has been mistaken, is attended with nausea and vomiting, no rash, and delirium almost from the commencement.

Morbid Anatomy.—There is nothing characteristic in the post-mortem appearances of a fatal case of typhus fever. If there has been marked delirium we may expect to find the cerebral sinuses engorged; but in the majority of cases the brain is seldom altered. The spleen is softened, and in some cases enlarged. The heart may be somewhat atrophied, and the blood “dark and fluid.” Should there have been an inflammatory condition of the lungs, indications of this will of course be found on examining the thorax. The intestinal tract is healthy.

Treatment.—As in all epidemics of contagious diseases, the first cases are to be watched with special care, if possible placed in separate hospital wards, and the clothes and effects disinfected. In the early incubatory stage, Dr. Hughes Bennett recommended an emetic, which he

said had saved him from one or two attacks, when he was certain the poison was in his system. If this stage be over, we must treat symptoms, remembering that we may guide, but can never cure a fever. A purgative of thirty to sixty grains of rhubarb may be given at the outset. Tepid water injections relieve after-constipation. The apartment should, if possible, be large and well ventilated, with a fire in the room. Intercourse with friends should be restricted, and attendance limited to skilled nurses. The head should be shaved, or the hair teased out, and cold lotions applied. The diet should consist chiefly of milk and weak broth, given in small quantities every two or three hours, in all five to six pints of milk daily.

The following general indications¹ with regard to the use of stimulants may thus be summarised:—Do not be in haste to begin them, and do not assume that once begun it is necessary to continue them all through the fever. Few do well with stimulants at the beginning of the continued fevers; as a rule they do harm until after the end of the first week, but much will depend on the type. Be guided in giving them by the type of the fever and the particulars of each case. Remember that signal loss of strength, rapid feeble pulse, and weakness of the first sound of the heart, are indications for their employment. If after the first dose the fever is increased, the temperature rising higher, and if the patient becomes restless, withhold the stimulant. But if he shows less languor, if the delirium is diminished, if the pulse becomes fuller, if the tongue is moister, if sleep comes on, and if the patient is easily roused from slumber, and sensible when roused, alcohol is beneficial; and *vice versa*.

The dose cannot be exactly regulated. You may begin with a tablespoonful of brandy or whisky diluted, and, if well borne, this may be continued, as circumstances require, every two or three hours, commencing in the morning. If wine is preferred, remember that sherry is

¹ These indications with regard to alcohol are general, and not limited to fever, but apply also to acute inflammatory conditions.

most palatable, and that port is not better than other wine. A mixture of chloral and bromide of potassium is beneficial, especially at the approach of the crisis, if there is great irritability, and sleeplessness (F. 69).

How are you to prevent bed-sores?

Carefully look at points most exposed to pressure. On a suspicious blush appearing, rub up alum with white of egg and brandy, and apply it over the part, or wash the part morning and evening, and apply glycerine cream. If, through carelessness or ignorance, they have formed, the slough may be removed by a charcoal poultice, and then iodoform should be dusted over the sore or sores. Undue pressure should be avoided by pledgets of lint or cotton-wool secured by sticking plaster; or, better still, put the patient on a water-bed.

The pulmonary complications are frequently relieved by hot poultices covered with oiled silk and the internal use of ipecacuanha wine first, followed, if necessary, by carbonate of ammonia. If the symptoms subside, these remedies must not be continued, as their tendency is to weaken the patient.

The excessive thirst may be obviated by cool drinks in abundance, water, lemonade, carbonic acid water, particularly that which has been made with distilled water.

Cold sponging is rather pleasant than useful, but high authorities recommend cool baths at about 87° Fahr., repeated day and night if the temperature rises above 103° Fahr. They are said to be generally well borne, and meet with no opposition from the patient, as soon as a few have been taken. In employing them it is not to be supposed that the patient is to be carried into a bathroom and then moved back to bed, but that a full-sized bath is placed near to his bed, into which he is carefully lifted. A sheet is placed hammock-ways in the bath and secured. Upon this he reposes while a large oiled silk covering prevents unnecessary exposure of the person.

TYPHOID FEVER.

Etiology.—The term typhoid literally means *like typhus*. It has also been termed “enteric,” “gastric,” or “pythogenic” fever. It is not, like typhus, markedly contagious, and it seems to be generated from, and is certainly disseminated by, bad drains, sewage gas, or fluids contaminated by sewage.

Symptoms.—The patient is attacked by the disease more insidiously than in typhus. There is no abrupt departure from health to disease. There may be a slight premonitory chill, followed by *malaise* and inability or aversion to work. The man feels out of sorts, and attends listlessly to his business; the child inclines to rest, and not to play with its toys. Then lying in bed is found to be a welcome relief, and there is no inclination to leave it. At the early stage of typhoid, as well as during the whole continuance of the fever, the thermometer is found to be of great value. Thus, even although the pulse indicates little deviation from health, it will be found that the evening temperature is higher than the morning by about a degree—99·9° F. morning, 100·5° F. evening; and this characteristic of a high evening temperature compared with that of the morning is retained throughout the disease. The temperature rises gradually, and may reach 105° F. towards the end of the first week, after which it again slowly falls to reach the normal state, by a series of oscillations between the morning and the evening temperatures, which may continue for an indefinite time, extending even to weeks after other symptoms have gone. The general symptoms of fever are present—as thirst, loss of appetite, and headache. The tongue loses the colour of health, and becomes small and dry, having a pale brownish-yellow fur, with red tip and edges.

About the seventh or eighth day of the fever small rose-coloured spots sometimes, but not invariably, appear on the abdomen, chest, or limbs, being situated on

normal uncoloured skin. They may be few in number or numerous. Their form is circular, and they last three days, disappearing completely under pressure, to reappear when that is removed. Fresh crops succeed those previously formed, until the termination of the fever. They are rarely seen after the thirtieth day unless a relapse occurs.

The abdomen becomes somewhat enlarged, and on careful pressure over the right iliac fossa a gurgling sound is generally heard, with distinct wincing or even actual pain. Even when delirium is present, this wincing is usually seen by looking at the face.

Diarrhoea is usually present. In some cases the stools are numerous, in others only two or three in the day. The colour of the stools is characteristic, and best described as being like that of PEA-SOUP. Occasionally they are tinged with blood. With diarrhoea there may be marked distension of the abdomen and tympanites.

Course and Progress of the Disease.—The disease may end in recovery or death. If the former, after the twenty-first day the severity of the symptoms abates, and gradual convalescence ensues; the temperature falls, presenting a gradual approximation of that of the evening and that of the morning. If the latter, the patient may sink exhausted and worn out by the disease, or fatal hæmorrhage may ensue, or peritonitis from perforation through the ulcerated spots on the small intestine. As in typhus, acute inflammatory disease of the chest may complicate matters and be the more immediate cause of death. Again, death may occur from inflammation arising from absorption of foetid matter from the ulcerated bowels.

Morbid Anatomy.—Characteristic traces of the disease are found after death, and are pathognomonic of typhoid fever. These are altered appearances of Peyer's patches and the adjacent mesenteric glands, and the lesions are most distinct in the group of glands nearest the ileo-cæcal valve. In the earlier stages the Peyer's patches are congested and swollen, and may be found projecting above the level of the mucous membrane like buttons. The



TYPHOID ULCERATION OF THE ILEUM
IN THE UPPER PART IS SEEN THE MORBID INTRUSION
PUSHING THE RUGÆ ASIDE; AT THE LOWER PART
THE DISINTEGRATION AND CHARACTERISTIC ULCERATION



surface of these raised patches may later on be eroded and ulcerated, and portions of them may slough away, exposing the muscular and even the peritoneal layers. The ulcer has sharply defined edges, and may vary in size and shape. Perforation of the thin floor of the ulcer is one cause of a fatal termination to the disease. The cicatrices left after these ulcers have healed commonly disappear after a few years. The mesenteric glands in the neighbourhood of the patches are enlarged.

Diagnosis.—Typhus and typhoid fever are both distinguished from febricula and relapsing fever by the longer continuance and course of the fever, along with the characteristic eruptions, and from one another by the following symptoms:—

1. In typhus the rash is mulberry-like, mottled, and continuous, going on to ecchymosis, and hence resisting pressure. In typhoid the rash consists of rose-coloured spots, fading in three days, and giving place to a fresh crop. These spots disappear on pressure, and are not surrounded by mottled skin.

2. In typhus, the rash appears from the fifth to the eighth day; in typhoid between the seventh and the fourteenth.

3. In typhus there is no diarrhoea. In typhoid diarrhoea is common, and the stools are of a pea-soup colour.

4. In typhus the symptoms are generally cerebral; hence disquietude going on to coma, with an intermediate stage of delirium. In typhoid the symptoms are abdominal; hence diarrhoea, and pain on pressure over right iliac fossa. In typhus we see contracted pupils, muttering delirium preceded by disquietude and uneasy manner, and *congested conjunctivæ*. In typhoid we see dilated pupils, delirium preceded by apathy and somnolence, and *no congestion* of the conjunctivæ.

5. These fevers also differ in their duration, a crisis being reached in typhus on the fourteenth day of the fever; while in typhoid, not a crisis but a lysis is reached on the twenty-first day. Typhus may occur at any age, and is commonest amongst the poor. Typhoid is gener-

ally a disease of youth or adult life, is rare after forty, and shows no partiality for the poor.

Treatment.—The prophylactic treatment is of essential importance, for if the disease spreads from the dejecta of the fever patient, it is obvious that these should be carefully attended to, and not thrown without due precautions into privies or dunghills, whence they may contaminate the water or milk supply, and give rise to extensive epidemics. Accordingly, Liebermeister recommends the use of a porcelain bed-pan, strewed each time before being used with a layer of sulphate of iron; and, immediately after the stool has been passed, crude muriatic acid is poured over the fecal mass. If practicable, as in country districts, the contents of the bed-pan should now be emptied into trenches removed from water-supply sources; and if in the town, where such a proceeding is impossible, thrown into the privy-vaults with a considerable quantity of the acid. Underclothing or bed-clothing soiled with the stools should be immersed in cold water to which a little chloride of zinc has been added, and then thoroughly boiled within twenty-four hours. Dr. Russell of Glasgow states that all washable articles should be disinfected by simple washing, and the experience of Belvidere Fever Hospital shows from statistics of ten years that the process is efficient for destroying the chances of infection. Dr. Russell justly adds "that a sick-room cannot be made a scientific laboratory where everything infected can be submitted to chemical or antiseptic manipulation. Steam and plenty of water destroy infection, while they do not render articles acted on useless for the future."

In investigating an epidemic of typhoid fever it is desirable to trace it to its source, and thus it will be essential in many cases, through neglect or ignorance of the prophylactic measures mentioned, to shut up suspected wells, stop the milk supply from an infected dairy, and in each hygienic regulation guard against a panic by giving to the people an intelligent reason for the institution of the measures adopted.

In individual cases a teaspoonful of ipecacuanha wine may be given every ten minutes until vomiting ensues, if the patient is seen in the early stage, and before the spots have appeared. Purgatives should be avoided. After the disease has been established, it is necessary simply to watch and treat symptoms.

Should the diarrhoea be excessive or weakening, astringents may be given. As a rule, I never give them unless the stools are more than four in the day, and then I give (F. 17, or 22). There is not the same necessity for caution as in typhus with regard to the administration of opium, and the drug may be given either by the mouth or rectum; if in the former way, combined with catechu (F. 17); in the latter, in the starch and laudanum injection. Should hæmorrhage occur, gallic acid is requisite, with brandy if there be great depression and exhaustion; or the pil. plumb. c. opio, turpentine, or the subcutaneous injection of ergotine may be tried. Ol. Terebinthinæ in ten to fifteen minim doses generally gives relief in flatulence and tympanitis. Delirium and sleeplessness may necessitate sedatives, such as chloral, the bromide of potassium, or both combined (F. 69). Tincture of hyoscyamus is also serviceable. All physical restraint should be forbidden, as patients are generally easily coaxed by a kind and skilful nurse to do what is requisite. Good ventilation, careful sanitary arrangements, cleanliness, and prevention of bed-sores, should be matters of routine.

"Attention to little things," as Sir William Jenner expresses it, is of paramount importance. Statistics prove that those patients who lay themselves up at its first approach, and do not attempt to fight against the disease, have by far the best chance of recovery. Thus, generally speaking, hospital experience testifies that of patients admitted at the end of the 4th day, 5 per cent die; between the 4th and 11th, 13 per cent; after the 11th, 28 per cent. Physical exertion, weariness, prolonged railway travelling, all movements, either on foot or horseback, or jolting in a carriage during the early

and insidious progress of the fever, are to be carefully avoided.

The patient should be confined to bed on the first suspicious symptom, and should not be allowed to leave it until the evening temperature is normal during three or six days.

Personally, I have found milk the best dietary for a typhoid fever patient, given at regular intervals of every hour or two hours, so that in all five or six pints are consumed in the course of the day. A little iced water may be given between times. Some supplement this by mucilaginous barley water, thin oatmeal gruel, and not very strong meat-soup. The general remarks made about stimulants under typhus apply equally to typhoid (see pages 33 and 34).

The nurse should see to the bed-pan being employed, and on no account should the patient be allowed to go to stool, however slight the fever. All unnecessary exposure when the temperature is taken should be avoided; all business affairs, all annoyances, kept away from the sick-bed. Questions should be briefly and kindly answered, but conversation studiously interdicted. The temperature of the room should be kept about 64° Fahr., not higher. Care should be taken of draughts, and in private houses, if practicable, a window should always be kept open in the next room, and the door between the two rooms never closed.

On the return of convalescence the patient should be warned against rising too soon, or changing the milk diet, or supplementing it by other food. It must be remembered that the ulcers are now cicatrising, and any error in diet may prevent this, and bring on alarming symptoms. Besides, relapses are not uncommon. An addition may gradually be made to the milk by a little weak soup or broth. Then give arrowroot with dry toast, and finally, beef-tea; although the latter should be avoided if there is any tendency to diarrhoea. The student should remember as a summary of dietetic treatment in typhoid fever that no solid food should be ordered until the tongue is clean, all pain on pres-

sure over the iliac region gone, and the temperature normal.

Latterly, under the impression that the true danger in this, as in other fevers, consists "in the deleterious influence of a high temperature" on the tissues, it has been attempted to lower the abnormal temperature. This treatment has been termed "antipyretic," and may be carried out as follows, if the temperature should be over 102·2° F. in the axilla:—1st, A full-length cold bath of 68° Fahr. of ten minutes' duration, and repeated so that in severe cases twelve baths are given every twenty-four hours; or 2nd, Give from twenty-two to forty-five grains of quinine within the space of half an hour or an hour, and do not repeat it, as a rule, until two days have elapsed. 3rd, In exceptional cases digitalis may be combined with the quinine, so that eleven grains of the powder of digitalis may be cautiously given at intervals during thirty-six hours, and followed by the large dose of quinine previously mentioned. This line of treatment in typhoid fever, according to the statistics of Liebermeister, seems to have been highly successful; but it is to be remembered that in English practice it has not yet been sufficiently tried to be absolutely recommended. 4th, A new remedy, "antipyrin," has recently attracted attention as an antipyretic. It is a synthetically prepared alkaloid, and is seen as a white powder, readily soluble in water; taste rather pleasant. It may be given to an adult in doses of thirty grains hourly for three hours. The dose for a child is mentioned afterwards under scarlet fever, page 61. This substance thus given reduces the temperature for several hours, and when its effects pass away the rise of temperature is not marked by rigor. It causes profuse perspiration, has no action on the respiration, and is excreted by the urine.

Finally, it must be remembered that a careful thermometric chart of the temperature, as taken morning and evening, is the only satisfactory index of the fever.

RELAPSING FEVER,

known also as recurrent typhus or famine fever, was long confounded with typhus, as epidemics of relapsing fever have usually co-existed with epidemics of typhus. Accurate historical records clearly show how careful observers saw its non-identity with ordinary typhus as far back as 1817, and how this opinion was confirmed by the remarkable epidemic of 1842-43, which was chiefly confined to Scotland. These opinions gained greater strength when it reappeared in 1846, and lingered with varying intensity in different parts of the United Kingdom until 1853, when it entirely disappeared from this country for fourteen years. In 1868 it was again observed in London, and also attacked other large towns. Since 1871 no cases of relapsing fever seem to have been noted. The observations made as to the nature of this fever clearly prove that it is highly contagious; that it may originate from filth, overcrowding, and destitution—notably the latter; that it is allied to times of scarcity, and thus has its home chiefly in the dwellings of the very poor. Lebert and other German observers found a strange peculiarity in the blood of relapsing fever patients, viz. thin, thread-like, spiral organisms of a vegetable nature, called the spirochæte. They occur in the blood during the onset of the attack, and are supposed to enter the system either directly or through the taking of fluids or solids. The period of incubation is from five to seven days. It is most common in early childhood, and from the 20th to the 30th year. Between 30 and 50 it is rare; and after 50 it is scarcely ever seen.

Symptoms.—Unlike the other fevers mentioned, there are no forewarners. The disease sets in suddenly with headache and intense fever, which at once prostrate the patient, and it is accompanied with thirst, loss of appetite, pain in limbs, and burning heat of skin. The temperature for the first two days is usually 102° F. morning, and 104° F. evening, and then it mounts to 105° F. and 107° F.

The pulse is weak and quick, and the skin moist. The tongue is thick and coated, not parched and black, as in typhus. The bowels are constipated.

On the second day the liver and spleen, especially the latter, notably enlarge—not merely from day to day, but from morning to evening. There is little delirium. The high fever, the rapid loss of strength, the splenic enlargement, indicate a fever likely soon to be fatal; when, as suddenly as it came, on the fifth, sixth, or more usually on the seventh day, there is a crisis, with profuse sweating, rapid fall of temperature, and complete improvement of all the symptoms, with entire decrease of the splenic enlargement. The only thing left is great languor, which sometimes may approach syncope.

This interval of freedom lasts usually a week, when a relapse occurs, generally at night, with all the symptoms which characterised the previous attack. This attack is, however, shorter, lasting only three or five days. It suddenly ceases, leaving the patient weak and anæmic, and entailing a lingering recovery of from four or five to six weeks. As many as four or five relapses have been known.

Prognosis and Complications.—In only two or three per cent of the cases is the fever fatal. Death may occur from the intensity of the fever, or from complications, as pneumonia or abscess of the spleen.

Post-Mortem Appearances.—If death occur from the disease, the spleen may be found greatly enlarged, the capsule tense, the parenchyma soft and pulpy, with wedge-shaped infarctions due to emboli. The liver and kidneys are also congested. Nothing of special note is observed in the other organs.

Treatment.—Rest in bed, cleanliness, milk, strong soup, and wine are necessary. A bladder of ice may be applied to the head, to relieve headache; and water charged with carbonic acid given to allay thirst. For splenic pain apply cold applications or continuous poultices.

Ten drops of dilute phosphoric acid should be given in sweetened water every two hours; if symptoms of collapse,

ammonii carbonas and alcohol; if delirium, 15-grain doses of chloral every hour, until one or two drachms have been taken.

During convalescence, good nourishing diet, with wine, and the preparations of quinine and iron, are essential.

INTERMITTENT FEVER, OR AGUE.

These fevers constitute a class by themselves, and were well known to the ancients.

They are dependent on certain marshy miasms, and are endemic, not epidemic, in character.

The febrile phenomena occur in PAROXYSMS, ushered in by rigors, and terminate by a critical sweat.

There are three distinct stages—1, a stage of chill; 2, of heat; 3, of sweat.

The fevers are divided into types according to the length of these stages, for the attacks occur pretty regularly—every twenty-four hours (quotidian); every forty-eight hours (tertian); every seventy-two hours (quartan).

The time between the commencement of one paroxysm and the beginning of the next is termed the INTERVAL; that between the termination of one paroxysm and the commencement of the next the INTERMISSION.

The type most common in temperate climates is the tertian.

Etiology.—While the predisposing causes are those which weaken the system, as exhaustion, insufficient food, intemperance, or exposure to night air, the exciting causes are certain peculiar invisible emanations, undetected by chemistry or the microscope, which are known as malaria, and spring chiefly from marshy lands. Most probably decomposing animal and vegetable matters, chiefly, if not entirely, the latter, furnish the *materies morbi*, for it is an established fact that ague in time past was common in certain tracts of country then uncultivated, whereas now, since the land has been drained and purified by agriculture, the disease is unknown.

Symptoms.—The invasion may take place suddenly or

after a few days of indisposition, with headache, loss of appetite, and sneezing.

The *cold stage* is characterised by chilliness first in the limbs, and afterwards over the whole body, with a sensation of streams of cold water running down the back; shrivelled skin, "*cutis anserina*," chattering of the teeth, blueness of the nails, hurried respiration, and small pulse.

The duration of this stage varies from half an hour to three or four hours, and is succeeded by the "*hot stage*" or reaction, with increased temperature, dry skin, great thirst, frequent pulse, and a peculiar fulness about the head.

This hot stage usually lasts from three to four hours, but it may be prolonged to six, eight, or twelve hours, and is then followed by the "*sweating stage*," beginning with a diminution of the heat, followed by a gentle moisture on the forehead and breast, and terminating in a copious, sour-smelling, steaming sweat, with an abundant flow of urine, normal pulse, and a cessation of all pain or uneasiness. The urine during the three stages mentioned varies; thus in the cold stage it is usually increased in quantity, clear and watery, of low specific gravity, and without sediment. In the hot stage it is voided but sparingly; it is also red and of high specific gravity. In the sweating stage it is passed freely; it is of high specific gravity, rich in solid ingredients, and throws down a brick-dust sediment of the urates. This stage in its duration cannot be easily determined, but it appears materially to exceed the other two.

The fever thus described rarely results directly in death, but it often induces permanent enlargement of the spleen, with induration, popularly known as the *Ague Cake*. The enlargement is a pure hypertrophy—that is, an enlargement of every element of the organ—and is accompanied by a peculiar cachexia.

There are also congestion and pigmentation in the liver, with serious disturbance of all the digestive organs. The patient is subject to cachexia from enlargement of the spleen, and even after his recovery from that he is much more subject to recurrences of the fever, which

do not necessarily require new exposure ; and the periodic character may imprint itself upon other diseases, as epilepsy or neuralgia. He seems to carry the seeds about with him.

Treatment.—In the cold stage the patient should be placed in bed covered with blankets and rugs, with hot bottles applied to his feet, and hot drinks, such as tea or weak negus, should be given.

In the hot stage cooling drinks are required, and the body should be sponged with tepid or cold water.

In the sweating stage great care must be taken to prevent chills, and the action of the skin should be encouraged by tepid drinks.

Quinine being the great remedy in this fever, it may be asked, When should it be given ? at what period of the fever ? and in what doses ? and how long should it be continued ? The answer to these inquiries may thus be summarised : It should be given DURING the INTERVALS, in a large dose, 20 to 30 grains, and at the CLOSE of the PAROXYSM, and repeated in 15-grain doses, with an interval first of one, then of two, three, and four days. Further paroxysms being thus averted, it should be taken for some months, not as an antipyretic, but in ordinary therapeutic doses. The reason why quinine is not given immediately preceding the paroxysm is that the stomach is apt to reject it, and it only aggravates what it fails to avert. Probably the hypodermic injection might hasten its action, and cut short the paroxysm, even though begun. The sulphate of quinine can be dissolved in tartaric acid in the proportion of 30 grains of quinine, 15 of tartaric acid, and half an ounce of water. So prepared it causes no pain on injection, and gives rise to no abscesses or other inconvenience. Each injection of 20 drops contains three grains of quinine. Ten minutes after injecting the quinine can be detected in the urine, by the tests of the iodide of potassium or the iodide of potassium and corrosive sublimate (F. 94).

REMITTENT FEVER

appears to be dependent on the same causes as intermittent fever, viz. malaria. It is also endemic, non-contagious, and is chiefly confined to tropical climates. The different localities in which it prevails have led to its being designated by various names. It is thus called Walcheren fever, Bengal fever, BILIOUS REMITTENT of the West Indies, JUNGLE or HILL FEVER of the East Indies, African fever, Mediterranean fever, etc.

The symptoms resemble those of intermittent fever; it is distinguished from it, however, by the notable fact THAT IN THE INTERVALS THERE IS NO ENTIRE CESSATION OF THE FEVER, BUT SIMPLY AN ABATEMENT OR DIMINUTION. The disease continues from twelve to fourteen days, and the period of remission varies from six to twelve or fourteen hours. It is worthy of note that a distinct sliding scale of periodicity can be traced from intermittent fever down through remittent to the severe tropical continued fevers.

Symptoms.—The fever is ushered in with gastric symptoms, uneasiness, depression, and sinking at the epigastrium, with headache and languor. The cold stage is scarcely marked, or, if so, is rapidly succeeded by a severe hot stage, with burning skin, vomiting, sleeplessness, intense headache, or even delirium. This stage, usually lasting the time mentioned, is succeeded by an indistinct stage of sweating or subsidence, and is followed by another attack similar to the first, but more severe. These attacks and varying remissions constitute the fever, which terminates in recovery or death, often in permanent ill health. Occasionally there is jaundice, and the liver and spleen are enlarged and tender. The remissions usually set in during the morning, while the exacerbations take place towards the evening.

Treatment.—The object of treatment is to mitigate the exacerbations, and lengthen the remissions, and is based on the same principles as those indicated in intermittent

fever. Thus, see that the bowels are acted on, sponge the body, or use the cold pack, and give effervescing and saline drinks. When the remission occurs, give quinine in doses varying from four to six grains every three hours, omitting the remedy when the hot stage commences, but resuming it at the next remission. Cold should be applied to the head if the headache is severe, and sinapisms to the stomach to relieve the gastric irritation. If there be much exhaustion, stimulants should be freely given.

At the termination of the disease the patient should, if possible, be sent to a temperate climate, or a non-malarious district.

In very chronic cases fresh air and outdoor exercise seem to be beneficial, with the administration of iron. Dr. M'Lean highly recommends the use of the biniodide of mercury ointment over the spleen, which has the advantage of never causing salivation.

YELLOW FEVER

requires an average temperature of at least 72° Fahr. for some weeks to produce its appearance, and seems peculiarly to affect the West Indies, Africa, and some parts of America.

It varies in severity, frequently terminating in death either by the acuteness of the fever, or by exhaustion or intercurrent complications, such as uræmia or apoplexy. It is sometimes epidemic, and it is a matter of dispute whether or not it is contagious. It appears to be dependent on some morbid poison, probably of malarial origin.

Symptoms.—The fever commences abruptly, often in the middle of the night, and is attended with severe headache, great irritability of the stomach, with vomiting, and a peculiar yellowness of the skin; the vomited matters at first being slimy and tasteless, and afterwards black, like coffee grounds—hence called *black vomit*. The urine is frequently suppressed; if passed, it is loaded with albumen and tube-casts, and is smoky in appearance. The fever usually lasts from three to five or seven days.

When six days elapse without the occurrence of black vomit or suppression of urine, hopes of recovery may be entertained. The mortality is usually one in three.

The symptoms of the fever point to the poison specially affecting the liver, which is supposed to undergo acute fatty degeneration. The poison is considered to produce certain specific changes in the blood—viz. destruction of the red corpuscles. The blood thus loses its capacity for nourishing and regenerating the tissues, and when death does not take place there is a lingering convalescence, consequent on the feebleness of the whole organism.

Treatment.—Although yellow fever is dependent on malaria like the preceding fever, it is to be remembered that the spleen does not seem to be affected, and hence, probably, quinine is of little service. We have no specific for the disease, and the treatment is thus symptomatic. At the outset castor oil and calomel are given to overcome the constipation which generally exists. For the relief of the nausea and vomiting ice may be swallowed, and morphia subcutaneously injected in the epigastric region.

Hæmisch suggests that transfusion after previous blood-letting might paralyse or modify the injurious operation of the yellow fever miasm. Late observations have tended to show, that yellow fever depends on a parasite, which perchloride of mercury and tincture of cinchona seem to kill, when the blood is drawn from a patient with yellow fever, and these remedies have been lately recommended for the disease.

As soon as the stomach is able to retain food and drink, a light nutritious diet is essential, with wine and quinine and preparations of iron.

DENGUE OR DENGÉ

is a peculiar exanthematous disease which has prevailed epidemically in Eastern Africa, British India, the West Indian Islands, and the Southern States of America. The epidemics invariably appear after long intervals, and they seem to originate independently of any antecedent case. After an interval of about fifty years, the last epidemic of Dengé originated in Zanzibar in 1870, and continued to spread in India till 1875.

Symptoms.—After a short, but indefinite, stage of incubation, the patient is suddenly attacked with pain and stiffness of the muscles, specially in the palms of the hands and soles of the feet, rendering every movement very painful. This is speedily followed by pain over the whole body, more particularly in the back, shoulders, and ankle-joints. After twenty-four hours there is swelling of the small articulations and severe pain on pressure. The febrile stage sets in immediately after the accession of pain, and is accompanied by a scarlet efflorescence extending between the cheek-bones, across the bridge of the nose. The average duration of the febrile stage is about forty-eight hours, and this is followed by a period of remission of from two to three days. On the fourth day, the febrile symptoms reappear; and, on the fifth day, the peculiar exanthematous eruption comes out, spreads over the entire body within forty-eight hours, extending from the head and face to the lower extremities. When the eruption has become general, the lymphatic glands begin to swell, the occipital invariably; the mucous membrane of the mouth and nose is implicated, and sometimes the throat. On the fifth and sixth days, the symptoms reach their maximum of intensity; and on the seventh or eighth day, desquamation of the cuticle begins, and terminates as in scarlatina. Dengé is very rarely fatal.

Treatment.—It is almost always necessary to administer an active cathartic, as obstinate constipation is the rule. Quinine, in five-grain doses, should be given, after the bowels have acted freely. When the febrile symptoms disappear, iodide of potassium, in four or five grain doses, should be given and continued during the period of remission and for several days after desquamation has been completed.

THE PLAGUE,

called by Heberden "The black death," was formerly prevalent throughout Europe, and terribly fatal. Now it is little known except in certain parts of the East, Egypt, and Asia Minor. It is caused by a morbid poison, which spreads by contagion, and is epidemic in its nature.

Post-mortem appearances reveal great congestion of internal organs, especially the spleen, with effusion into serous cavities.

It is characterised during life by fever of a low type, with high delirium tending to a typhoid form, by enlargement of lymphatic glands and formation of buboes, with carbuncles and ecchymoses, vomiting of black matter, and hæmorrhage from the mouth, stomach, and bowels. There is often, also, a cutaneous rash like that of typhus.

It terminates most frequently in death.

TABULAR STATEMENT OF CHIEF POINTS IN FEVERS.

	Incubation.	Eruption appears on	Eruption fades on
TYPHUS	usually 1 to 14 days	{ 5th day of fever on back and sides	} 14th day of fever.
TYPHOID	14 to 21 days	{ 7th or 8th day of fever on abdomen	} 21st to 30th day of fever.
SCARLET FEVER	4 to 6 days	{ 2d day of fever on trunk	} 5th day of fever.
SMALL-POX	12 to 14 days	{ 3d day of fever on face and forehead	{ scabs form on 9th or 10th day of fever, and fall off about the 14th.
MEASLES	10 to 14 days	{ 4th day of fever on forehead	} 7th day of fever.
GERMAN MEASLES (Rötheln)	7 to 14 days	{ 2d to 4th day of fever on face	} 4th to 6th day of fever.
CHICKEN-POX	10 to 14 days	{ 1st day of fever on shoulders	} on 4th day of fever the vesicles form scabs.

ERUPTIVE FEVERS.

Small-pox, measles, and scarlet fever, are simply continued fevers, with a characteristic eruption superadded. In these fevers a definite period of time elapses from the reception of the fever until the appearance of the eruption and its final disappearance. Thus, measles has an incubation of from twelve to fourteen days, the eruption appearing on the third or fourth day of the fever, and fading on the seventh.

Scarlet fever has an incubation of from four to six days, the eruption appearing earlier than in measles, viz. on the second day of the fever, and disappearing on the fifth. Small-pox has an incubation of from twelve to fourteen days, the eruption appearing on the third day of the fever. The eruption does not fade away so rapidly as in the other two; scabs form on the tenth day of the fever, and commence to fall off about the fourteenth.

These fevers are distinguished from one another not merely by the facts mentioned, but by other peculiarities.

SMALL-POX.

The first authentic narrative of small-pox as a distinct disease is given by an Arabian physician, Rhazes, in the year 900, and it was recognised in after years as the most dreaded scourge of the human race, as the hereditary curse of mankind, as an inheritance which neither time nor medicine could dissipate. To rob it of some of its terrors, to modify its most alarming features, Lady Mary Wortley Montague, in 1718, introduced the practice of inoculation. The essential character of this proceeding was the insertion of small-pox matter in a healthy person, and it was found that small-pox so imparted gave rise to a milder form of the disease, and less chance of succumbing to the virulence of the poison than when caught in the ordinary way. The benefits conferred by its adoption were great to the inoculated; but small-pox perpetuates small-pox, and in proportion as inoculation was actively undertaken, centres of contagion were multiplied, and almost every home was converted into a hospital. Inoculation did not diminish, nay, it actually increased, the mortality from small-pox.

The vitality of the disease was thus not conquered when Edward Jenner, on 14th May 1796, announced the birthday of vaccination. On that day matter was taken from the hand of Sarah Nelmes, who had been infected by her master's cows, and it was inserted into the arm of James Phipps. Satisfactory vaccine vesicles ensued. Subsequent experimenting by small-pox inoculation on the same boy yielded a negative result, and Jenner believed that vaccination, actively and efficiently performed, would in the course of time obliterate small-pox, and cause it only to be remembered like extinct epidemics of the Middle Ages. This estimate—naturally a sanguine one of Jenner's—has not been confirmed, for small-pox still exists, it may be owing to gross carelessness or wilful neglect, or inefficient performance of vaccination; and when it occurs on an unvaccinated person, it has lost none of those features which rendered it so repulsive and fatal in bygone times. It is still the loathsome malady dreaded by all who have seen it, and even avoided by those who know it only by repute. Occurring, however, on a person who has been previously vaccinated, it is a mild, non-fatal disease, and loses also its hideous characteristics. Briefly stated, it may be said then to present an eruption limited to a few scattered uncoalescing pustules, which reach their acme on the fourth day, and then heal and die away. There is no delirium and no pitting in the vast majority of cases, and the mortality is only 1 per cent. Except in the premonitory fever, which is of the same intensity in both, the two diseases are essentially distinct.

After these remarks, it may now be observed that in small-pox a specific poison is taken into the system, and after twelve days' incubation fever is ushered in with shivering, weariness, and PAIN IN THE SMALL of the back, AND VERY FREQUENTLY VOMITING. These two latter symptoms are very characteristic of small-pox, and may guide in distinguishing it, before the eruption appears, from the two other fevers mentioned. Sometimes very acute delirium may appear in the first twenty-four hours, not remaining over three days. In children convulsions are substituted for the delirium. Lachrymation and salivation are often early symptoms. A papular eruption appears on the third day on the forehead, neck, and hands, then on the trunk, and lastly on the lower extremities. If the papules remain separate and distinct, we have what is termed Simple Small-pox, or Variola

Discreta. If they are numerous, they coalesce, and we have Confluent Small-pox, or *Variola Confluens*.

In *Variola Discreta* we observe on the third day a vesicle forming on the papule, and around this an inflamed area. Two days after this the transparent lymph, which the vesicle at first contains, is changed into pus. After this the top becomes gradually depressed until it divides the pustule into two. This condition is termed *umbilication* and is very characteristic of the small-pox eruption. A peculiar greasy odour, difficult to describe, but never forgotten if once perceived, is now apparent in the room.

About the ninth or tenth day the pustule breaks and a scab forms. These scabs fall off about the fourteenth day of the fever, and a red stain is left on the skin, which gradually disappears. Should, however, the true skin be attacked, a permanent mark remains, and the patient becomes pock-marked.

In *Variola Confluens* the simple state of matters we have described is generally altered for the worse. The headache, the pain in the back, and the vomiting, are more severe, and a more copious eruption appears. Developing as the simple type did, the vesicles become so continuous as to render it sometimes impossible to put a pin's head between them. This is specially observed in the face, which becomes so swollen as to render the features unrecognisable. Large black scabs form, and the characteristic odour is sickening in the extreme. The mucous membranes of the mouth, larynx, and trachea, are implicated. The voice is husky, throat sore, and swallowing is difficult. Cough and dyspnoea are also distressing, and there is delirium.

There is thus a very marked distinction between the general appearance and symptoms of the simple and the confluent type of small-pox, and there is also a great difference in what is termed "The Secondary Fever." This term is somewhat puzzling, and hence it is necessary to explain that the high fever which precedes the small-pox eruption in either form abates when the eruption

appears. This is designated "The Primary Fever." It is to be noted that in Epidemic Small-pox, patients may catch the infection, and die during the Primary Fever stage, and before the development of the vesicular eruption. It would appear that the intensity of the poison thus early destroys life, but yet during life it may be apprehended if, with great prostration and high fever, there is an intense bright brick-red stippling of the skin, most abundant on the lower part of the abdomen, and on the thighs, accompanied often with scattered "fleabite" petechiæ, with conjunctival ecchymoses, with "black-eye" ecchymosis, livid markings of the face, with hæmorrhage from mucous surfaces. The stippling becomes more diffused, deepens in hue to violet, and, if the patient lives long enough, becomes the seat of a vesicular eruption. This form of small-pox is termed Hæmorrhagic, Black, or Malignant, and is not unfrequently mistaken for purpura, and its non-detection and separation of the patient from the rest of the household may lead to serious consequences. It is said that the "stippling" described is very striking and characteristic. Fever again appears as the pustules mature on the eighth day of the eruption, or eleventh of the fever, and then it is termed "The Secondary Fever," which is of a typhoid or inflammatory type. As might be expected from the description of the two forms of small-pox given, it is slight in the first variety (*variola simplex*), while it is violent in the second (*variola confluens*), and very often proves immediately fatal. It may be accompanied by boils, erysipelas, or ulceration of the cornea or *membrana tympani*.

Prognosis.—In persons who have been previously vaccinated efficiently, or in whom the attack is non-confluent, the disease is rarely fatal. In those who have not been vaccinated the mortality is one in three. Further, if the papules be filled with blood (hæmorrhagic form of eruption) or serum, not umbilicated, and if extending, the prognosis is extremely unfavourable. Lastly, the "corymbose" form of eruption (where it groups itself into patches) is of very bad omen.

Treatment.—There is no contagion so sure as small-pox, none which acts at a greater distance, and hence prophylactic measures are of paramount importance. The sick person should be isolated, and those in attendance, before seeing other people, should change their clothes, after thorough ablution. If the disease has entered a household of the poor, removal to a special hospital is essential. Every one likely to be exposed to the contagion should be re-vaccinated, and patients who have recovered should be kept in the strictest quarantine until all crusts have fallen off. Clothes worn or bedding used should be destroyed, and the apartment thoroughly fumigated before again being occupied. Neither vaccination nor medicine is of any avail when small-pox is incubating or has appeared. The disease must run its course, and all that can be done is to enable it to do so under the most favourable circumstances. The patient should be kept in a cool, well-ventilated room. The diet ought to be light, and saline draughts or lemon-juice may be administered to diminish the thirst and regulate the bowels. The only internal medicine which seems to have any efficacy in the pustular stages of small-pox is salicylic acid (F. 6b).

In the secondary fever, if it be severe, quinine (F. 75) and stimulants should be given, with good broth or strong beef-tea. If there is great restlessness, opium or bromide of potassium and chloral are useful. If the sores are sloughy, and the system is greatly depressed, wine or brandy must be administered to sustain the strength through the attack. If the mouth and pharynx are much involved, a weak solution of iron may be employed as a gargle, and mucilaginous drinks, to which some chlorate of potass may be added.

Locally no escharotic treatment seems of any avail. The pustules should be smeared with cold cream, or carron oil, or carbolic acid lotion (F. 56a, 6b), or with oxide of zinc and hydrocyanic acid to relieve the itching (F. 61). Iced compresses, moreover, applied wherever the eruption is abundant, are said to diminish the pain and swelling better than anything else.

When the pustules have burst, some dry powder of starch or oxide of zinc should be applied.

All scratching should be prevented, and to effect this the hands of young patients should be tied.

Warm, slightly alkaline, baths may be given during the stage of decrustation every day, and the body afterwards anointed with oil or any kind of fat.

VACCINIA, OR COW-POX.

The remarkable discovery of Jenner towards the end of the last century marks an era in medicine. All experience testifies that, while vaccination does not infallibly prevent small-pox, it yet so far modifies the disease as to rob it of its disgusting phenomena and sequelæ, and to render it a comparatively trifling malady. It is unnecessary to detail the process of vaccination further than to state that after the simple operation has been performed, a little redness and elevation can be detected on the SECOND day. A vesicle with depressed centre and raised edges is seen on the FIFTH, and reaches its acme on the EIGHTH day. It is now observed to be composed of a number of cells containing clean lymph and situated on a hardened base. On the NINTH or TENTH day these burst, and a scab is formed, which finally falls off on the TWENTY-FIRST day, leaving a well-marked permanent cicatrix.

A little constitutional disturbance attends the process.

VARICELLA, OR CHICKEN-POX,

is a trifling affection, attacking infants or young children, attended with only slight fever, if with any. The eruption consists at first of pimples, which on the second day are converted into vesicles. These burst on the fourth day, and rapidly dry up. The rash first appears on the SHOULDERS or TRUNK; subsequently it may attack the scalp, but it rarely involves the face. Chicken-pox has been occasionally mistaken for a mild case of small-pox,

and mistakes in diagnosis are apt to occur when there is a small-pox epidemic.

It is therefore to be carefully remembered that the points which should guide us in distinguishing the two are the mildness of the premonitory symptoms; THE FIRST APPEARANCE OF THE ERUPTION ON THE TRUNK INSTEAD OF THE FOREHEAD; THE PAPULES RAPIDLY BECOMING VESICULAR; THE ABSENCE OF HARDNESS ROUND THE VESICLES; AND THE SHORTER COURSE OF THE DISEASE. It seems to have an incubation of four days, and is undoubtedly contagious.

SCARLET FEVER

is eminently contagious. It is usually a disease of childhood, occurring once in a lifetime, and it derives its name from the character of the eruption, which is red, minutely punctated, appearing on the second day of the fever or earlier, and lasting three days. It COMMENCES on the ARMS and TRUNK and LOWER SIDE of the thighs, and thence proceeds to the face and the inferior extremities. In addition to the fever and the eruption, the disease evidences itself on the tonsils and mucous membrane of the mouth and pharynx.

It varies in severity, and hence has been divided into

Scarlatina Simplex,
,, Anginosa,
,, Maligna.

In *Scarlatina Simplex* the fever runs a simple and natural course, the eruption appearing after the usual incubatory stage, disappearing on pressure, fading on the fifth day, and terminating generally with desquamation of the cuticle on the face and trunk. This desquamation takes the form of scurf on the body, while on the hands and feet large patches of skin may come away at once. The process of desquamation may continue for days or weeks, accompanied by itching. The tongue in scarlet fever is very characteristic. At first it may be covered with a white fur; as this clears away it becomes red,

the lengthened filiform papillæ project, and the organ presents a STRAWBERRY appearance. The tonsils and mucous membrane of the mouth are congested, but in a mild degree.

In *Scarlatina Anginosa* the fever is of a much more violent character, being often attended with delirium, great restlessness, and prostration. The temperature often attains the highest point in the first twenty-four hours of the fever. This point varies much, and may, although rarely, reach 109° or 110° F. The eruption may be delayed to the third or fourth day, is of a more livid colour, and it may be even patchy and evanescent. The throat symptoms are more severe, the tonsils being greatly swollen, and ulcers frequently forming on them. The neck is stiff, the sub-maxillary glands enlarged, and deglutition is difficult. Even after the eruption has disappeared, the throat symptoms do not abate in severity, as in the simple form.

Scarlatina Maligna is attended with marked cerebral disturbance, passing into coma, and with great vital prostration. Tenacious phlegm hangs about the mouth and throat, the teeth are covered with sordes, the tonsil ulceration may become gangrenous, and the breath is very offensive. The rash is irregular in its appearance and its continuance, and is of a livid colour. This variety, as its name implies, is usually fatal. The vital powers succumb to the strength of the poison on the fourth or fifth day. Hope may, however, be entertained if the seventh or eighth day is passed.

The dangers arising from scarlet fever, considered as a whole, do not terminate with the subsidence of the fever. Troublesome and even fatal sequelæ may result. The cervical glands may remain permanently enlarged—abscesses may form—ophthalmia result—or a muco-purulent discharge obstruct the nares, or the throat affection may spread from the pharynx up the Eustachian tube, causing disease of the ear and deafness. One of the most common and not the least dangerous sequela, however, is the affection of the kidneys, resulting in anasarca and albuminous

urine. It is to be carefully observed that this result is most common in those cases where the primary fever was of a mild form. The patient has probably suffered little or no disturbance from the fever, and is perhaps exposed to cold or draughts during the stage of desquamation. The excretory powers of the skin are impeded, and increased work is thrown on the kidneys, bringing on acute desquamative nephritis (acute Bright's disease). This may be ushered in with shivering, fever, and pains in the back, or it may come on insidiously. The face becomes puffy, and this is followed by general swelling, with scanty, high-coloured, and albuminous urine. Under the microscope the urine presents blood corpuscles, coagulated fibrin, and epithelial casts.

Anatomical Changes.—There are no distinctive post-mortem appearances in scarlet fever. The ordinary anatomical changes may be summed up in a single sentence—Erythematous inflammation of the skin, with superficial oedema; inflammation of the fauces, and congestion and catarrh of the tubules of the kidneys.

Prognosis.—The throat is the source of greatest danger. "Whenever," says Sir Thomas Watson, "I see the glands much enlarged at the angle of the jaw, and beneath the jaw, in a child suffering from scarlet fever, I augur ill of the disease." If, in addition, the urine is very scanty and albuminous, the danger is increased by a tendency to uræmia. When these symptoms are absent the prognosis is more favourable. In the majority of cases the dropsy disappears, though serious permanent injury to the kidney may be the result.

Treatment.—Attention to the bowels, with a slight febrifuge mixture, and rest in bed, are alone necessary in simple scarlet fever. For a drink in this, as in the more severe forms, potass. chlorat. 60 grains, in a pint of water, may be given freely. The parents should be warned to keep the patient in bed in a warm room, until the desquamation is over, and after that flannel should be worn. A warm bath may be given to bring out the eruption.

In *Scarlatina Anginosa*, in addition to the above, if the

fever is considerable, tepid sponging, or wet-sheet packing, may be employed. Shaving of the head, and the application of vinegar cloths afterwards, should be insisted on. If the throat is much inflamed, and the patient is an adult, five or six leeches should be applied. If a child, hot poultices should be applied instead of leeches. Tincture of aconite in minim doses every quarter of an hour, or half hour, until the fever is lowered, then every hour or two hours as may be deemed necessary, to keep up the antipyretic action. If the throat is much affected, potass. chlorat., tinct. ferri perchlor. and glycerine (F. 91b), and ammonii carbonas 2 to 3 grains in milk every two or three hours, when prostration is great. When the fever is high, and patient delirious, sulph. quinine gr. iii. thrice daily in milk, to a child of five years; or antipyrin, one grain and a half for each year of the child's life at an interval of three hours. Beef-tea and wine are necessary if the patient is weak and prostrated.

The great prostration in *Scarlatina Maligna* necessitates from the first a stimulating treatment. Wine or brandy should be given freely. Three ounces of port wine may be given to a child, and double or treble that quantity to an adult, in the twelve hours.

The ulceration of the throat ought to be touched with nitrate of silver, or with a mixture of tannin and glycerine, if the child does not offer marked resistance. Ammonii carbonas as previously recommended should be given from the commencement of *Scarlatina Maligna*.

In all cases the body should be rubbed with oil, as this facilitates desquamation. Should, however, the desquamation be arrested and anasarca result, the loins ought to be cupped, and this should be followed by the constant application of hot linseed meal poultices. This arrested desquamation is frequently attended with high fever and considerable lumbar pain. The application of a few leeches is advisable in such cases, and often, in children, gives great relief and diminishes the fever. Should there be no pain, and should the anasarca be insidious, leeches are unnecessary; but the loins ought to be cupped

as previously stated. It is said that tincture of aconite, at carefully regulated intervals, is very effectual in cutting short the incipient inflammation.

Hydragogue cathartics are also necessary to relieve the strain on the kidney, and of these, pulv. jalapæ co., or elaterinum, seem the best. Iron, either in the form of the tincture or ferr. ammon. cit., should be ordered, in as large doses as the system can bear without producing headache or nausea (F. 89). The diet should be generous, with plenty of milk; and a uniform temperature of 60° Fahr. should be insisted on. Under such treatment the dropsy may be successfully combated, and the albumen disappear from the urine. In some cases the anasarca becomes very considerable, and is not relieved by the treatment mentioned. It may then be advisable to insert Southey's needles, with the drainage tube attached, to let out the pent-up fluid. If uræmic convulsions threaten, blood-letting, general or local, may be resorted to, together with the other means suggested under "Uræmia." In convalescence from any form of scarlet fever the urine should be daily tested.

MEASLES

was long confounded with scarlet fever, and it is only since the beginning of the last century that it has been recognised as a specific and independent disease.

Measles is contagious, but the cause of the contagion is unknown. Susceptibility to the contagion diminishes with years, and SECOND ATTACKS ARE RARE. The incubatory stage of measles, judging from the epidemic in the Fiji Islands, and other isolated instances, lasts from ten to twelve days.

Symptoms.—Measles may be considered a catarrhal fever, with a characteristic eruption added to it, the eruption appearing first on the face and forehead, and afterwards on the trunk and extremities. The symptoms of catarrh—running at the eyes and nose, cough and sneezing, with great oppression and foul tongue—precede the

eruption. The fever which accompanies these catarrhal symptoms indicates that an exanthem will follow. This fever, with a temperature it may be of 102° Fahr., lasts for three or four days, when an eruption of small circular dots, like fleabites, appears on the forehead, spreading to the trunk, limbs, and feet. These do not remain distinct, but coalesce, until patches of a reddish colour and of irregular shapes cover the parts affected, accompanied by flushing of the face. Thirty-six hours from the commencement of the eruption the temperature is highest. The eruption lasts THREE days, and disappears in the same local sequence as it came.

There are two kinds of measles,—the essentially mild, and the severe.

Of the first variety there seem to be two forms—measles without catarrh, and measles without eruption.

The former attacks chiefly young persons, gives rise to little sickness, yet effectually destroys the after-susceptibility to the disease.

The latter variety is seen during an epidemic of measles, and we are justified in assuming a person to have it, if the catarrhal symptoms are as severe, as if the patient had a measly rash, and if the person becomes non-susceptible to the disease.

The essentially severe form of measles, popularly termed “black measles,” is generally associated with the hæmorrhagic diathesis. Before or after the eruption of measles, hæmorrhage occurs in various regions: in the skin, causing petechiæ or ecchymoses; in mucous membranes, causing violent bleedings from the nose, or in organs and cavities.

The general symptoms are those of a typhoid character; sordes on the teeth, small pulse, debility and diarrhoea.

Complications.—Catarrhal pneumonia and bronchitis—an extension of the catarrh down the respiratory tract—are chiefly to be dreaded in measles. They appear after the eruptive stages, and intensify the fever and increase the danger. Of fatal augury are livid lips, cold extremities, and a rapid feeble pulse. Cerebral complications,

peculiar forms of ophthalmia, dropsy, and albuminuria, are not unknown.

Prognosis.—As a general rule it may be stated that measles is essentially dangerous to very young children, and that the danger decreases rapidly with years, except in old age, when it may be fatal. Unusual sparseness or paleness of the eruption, or the hæmorrhagic diathesis, are bad omens. If the chest is only slightly affected, or not at all, we may predict a favourable result. The great danger is not in the disease, but in what it leaves behind it, such as lobular condensation or collapse of the lung, or a tendency to emphysema in after life.

Treatment.—As the greatest danger in measles is an extension of the catarrh to the lungs, all exposure to cold must be avoided. The room should be darkened, and the patient kept in bed. Milk diet, attention to the bowels, and a slight diaphoretic mixture, are all that is required in ordinary cases (F. 34).

If there is severe coryza, warm water may be drawn through the nose. Emetics are useful at the commencement to prevent cough, and cold compresses may be applied to the abdomen if diarrhoea is excessive. Should chest complications ensue, the principles of treatment to be afterwards spoken of under Acute Bronchitis should be adopted. Trousseau has recommended whipping the whole skin with nettles to bring out the eruption.

In the typhoid state associated with the hæmorrhagic diathesis, wine and stimulating expectorants are essential (F. 72).

RUBEOLA, RÖTHELN—GERMAN MEASLES.

The term rubeola was brought into use by German physicians about the middle of the last century to designate a disease, which it was considered could belong to no one of the acute contagious or non-contagious eruptions, though closely resembling measles and scarlet fever.

Opinions with regard to it have greatly varied, but latterly it has been shown that it is an independent

disease by distinct epidemics of it, and by the fact that while it ensures against a second attack of itself, it affords no protection from measles or scarlet fever.

Recognising it, therefore, as a contagious and essentially epidemic, and thus also specific, disease, it may also be noted that it is especially a disease of childhood, attacking indiscriminately boys and girls, and older and younger children, down to sucklings. A second attack is rare—as rare as that of measles. Its contagion is not quite so great as that of measles.

It consists of an eruption on the skin of numerous discrete blotches, from the size of a pin's head to, at the utmost, that of a bean, slightly raised above the level of the skin, with at times a distinct, at others a faded, border.

The spots are round or oval, and are well marked on the face, their colour being of a pale rose-red. They are seen on other parts of the body, especially on the neck, scalp, and thighs; while on the forearms, hands, and lower parts of the legs, they are not so common.

The eruption lasts usually for two days, and then disappears without any desquamation. The size of the spots is less than that of measles, the form being more round, and the colour paler.

The course of the disease in the majority of cases is as follows:—After the patients have coughed and sneezed somewhat, and manifested slight photophobia, from a few hours to a day, one notices—either at once, or after the attention has been excited by a gradually increasing temperature—the beginning of the exanthem on the face. While now the exanthem gradually spreads over the body, the temperature, if increased, becomes quickly normal again. Thus children generally object to stay in bed, and would prefer to be out of doors.

In ordinary rubeola there are no other local symptoms, except slight catarrh at times, some difficulty in swallowing, and some diminution of the appetite.

Prognosis.—Its almost feverless course makes the prognosis most favourable, but the disease may be complicated with bronchitis, and may have a fatal termination.

Treatment.—The treatment of rubeola is restricted to a suitable regimen ; protection against exposure, keeping the patient in bed, if feverish, and attending to probable catarrh of the air-passages and the pharynx.

Other complications, if any, should be treated according to their nature.

CEREBRO-SPINAL FEVER, EPIDEMIC CEREBRO-SPINAL MENINGITIS.

This peculiar disease appears to consist in an inflammation of the membranes, and sometimes also of the substance of the brain and spinal cord. Its origin is unknown, its epidemic character undoubted ; but its contagiousness is questioned. It affects chiefly the male sex between fifteen and thirty, if crowded together during cold weather, as in barracks or workhouses.

Symptoms.—The attack is sudden and characterised by intense pain in the head, prostration, with spasm and rigidity of the muscles of the back of the neck, and great sensitiveness of the whole surface of the body. The temperature of the body is abnormally low at first, and never reaches any great height. A peculiar petechial eruption is often present on the neck, breast, or limbs, of a red, purple, or black colour, and varying in size from a pin's head to three-quarters of an inch in diameter. The course of the disease is rapid, as some die within a few hours, many within twelve or twenty-four. The first four days are most dangerous ; after that time there appears to be a fair prospect of recovery. About half of those attacked die.

Treatment is unsatisfactory. Stimulants are recommended from the outset, with the application of leeches behind the ears to relieve the headache, and ice to the spine and head to mitigate the spasm. Chloral and bromide of potassium, and the hypodermic injection of morphia, have been strongly urged ; and its resemblance to malarial fever has suggested the use of quinine.

SUB-GROUP 1.

CHOLERA.

Synonym—Asiatic Cholera.

The authentic history of cholera dates back only to 1817, when it made its first appearance in India. After a series of destructive epidemics in the East, it reached Europe, and was imported from Hamburg to Sunderland on October 26, 1831, thence spreading to the great centres of population in this country. This epidemic lasted during 1831-32, when there was a lull; the next epidemic being in 1848-49; the third during 1853-54; and the last during 1865-66, when it was chiefly confined to London.

Cholera seems, according to the views of most recent authorities, to owe its existence to one single ultimate cause, a cholera germ, which again is supposed to be of a parasitic nature, and develops in the gastro-intestinal tract, in the interior of the follicles of the small lymph and blood vessels, and of the submucous connective tissue. Koch states that comma bacilli are specific bacteria belonging alone to Asiatic cholera. Further, that by injections of pure cultivations of comma bacilli cholera can be induced in animals. Animals so treated die in a short time; comma bacilli are found in the intestines in extraordinary numbers after death. If the parasitic origin of cholera is granted, it can be understood how in different degrees of vitality these germs can be carried by the air in viewless numbers, and impregnate the water supply, or be drawn directly into the mouth; the different degrees of vitality accounting, to some extent, for the choleraic diarrhoea which, as will be seen, always accompanies the true disease. Experience testifies that nurses and hospital physicians exposed to the concentrated miasma from the dejections, or washerwomen who wash the linen soiled with cholera dejections, rarely escape taking the disease when it is epidemic; while the

fact of outdoor physicians attached to hospitals passing safely from bed to bed, and again out into the open air, seems to indicate that cholera is not contagious.

Cholera is more common in hot than in cold weather. Although common in childhood and adult life, it is pre-eminently a disease of between twenty and thirty. Excesses of every kind, whether of food, wine, or fruit, during the continuance of the epidemic, predispose to it. The average incubatory period is from twelve to twenty-four hours, rarely exceeding one week. About one-fifth of those attacked survive.

SPORADIC CHOLERA.—*Synonyms*—Choleraic Diarrhoea, Simple Cholera.—In this country diarrhoea usually accompanies the cholera epidemic, coming on suddenly, the stools being fluid, painless, yellowish brown, and in number averaging from two to four in the twenty-four hours. It is difficult to diagnose this affection from true Asiatic cholera, especially if there is existing epidemic cholera in the country. If epidemic cholera does not exist it will be found that the DIARRHOEA does not merge, as in true cholera, within a FEW HOURS, into collapse; neither has the countenance the PINCHED WAN LOOK, nor the VOICE the CROAKY SOUND, nor the radial ARTERY the PULSELESS feel, which characterise TRUE cholera.

The prognosis is therefore favourable. Rarely does an adult die of sporadic cholera. In infants and old people death occasionally occurs.

Treatment.—An infant with sporadic cholera may be allowed to suck ice or to take a little cold iced water, but no food should be given for eight or ten hours. A poultice of linseed and mustard may be applied over the abdomen. Should this treatment fail within the time mentioned, calomel, gr. i., may be given if vomiting is a prominent symptom; or if, on the other hand, diarrhoea predominates, the calomel may be replaced by castor oil—one teaspoonful. Astringents should follow after the medicines have had time to act, in the form of mist. cretae (F. 18) or bismuth (F. 20). In adults iced water is not necessary, and a mixture of acid sulph. dil. and tinct.

opii should at once be prescribed (F. 16), or x grs. of pulv. Doveri or catechu, opium and chalk (F. 17).

TRUE CHOLERA.—*Symptoms.*—Diarrhoea of an epidemic character rarely fails to precede the real attack, and may last from a few hours to some days.

The symptoms of cholera vary greatly in intensity, especially in tropical countries. In many cases the patient, apparently overwhelmed by the poison, falls down, and dies within one or two hours, without vomiting or diarrhoea. In typical uncomplicated cases, as observed among primitive races, the first symptom is always giddiness or swimming in the head; and in a short time the contents of the stomach are suddenly ejected, without much nausea. A peculiar sensation of faintness or sinking is next experienced, and then the bowels are evacuated. In very severe cases the patient becomes pulseless at the wrist within one or two hours, and before the vomiting or diarrhoea has proceeded to any great extent a cold perspiration covers the body, and although the surface has the cold feeling of a dead body, the patient complains of an intense burning heat, and implores to be sponged with cold water. There is persistent vomiting and diarrhoea, with intestinal cramps; the body becomes shrivelled and corpse-like; the bladder is empty, but there are intense and frequent calls to micturate; the voice becomes croaky; the carotids cease to pulsate, and death supervenes, the body having the appearance of being dried up.

In this country the attacks frequently commence during the night, and the symptoms are less intense. The patient awakes chilly and dizzy, and this is rapidly followed by a tempestuous diarrhoea, the early stools being black and pappy; but as the bile pigment quickly disappears, they exhibit the **CHARACTERISTIC RICE-WATER APPEARANCE**. They are passed involuntarily and painlessly, and in number vary from three to fifteen. After the diarrhoea has lasted one or two hours, vomiting, attended with no pain, sets in, at first of the food which may have been taken, and latterly assuming a colourless whey-like ap-

pearance. Intense thirst and suppression of urine are now prominent symptoms. The tongue is, as a rule, white. After a few hours, distressing cramps supervene, especially of the calves and feet—rarely of the hands. Sometimes these are entirely absent, and the patient sinks without a struggle. There is also a considerable fall of temperature, commencing in the hands and feet, and most marked on the face, nose, and tongue. Should there be a tendency to recovery, the temperature approaches the normal; if it does not, the features become more pinched, the extremities more cold, livid, and collapsed; the eyes dry, the cornea cloudy, and the voice assumes a hoarse and raveny character, or it may sink into an inaudible whisper. This peculiar character has led to its being called “*vox choleraica*.” This stage has been termed the *algid* or *cold stage*, and either terminates in death or passes into what is called the stage of reaction. The earliest sign of improvement, preceding even the abatement of the diarrhoea and vomiting, is the *RETURN* of the *PULSE* at the wrist. Heat follows, the blueness disappears, the temperature becomes normal, and convalescence may be regarded as perfect in from ten to fourteen days. Sometimes the improvement is only transient, being followed by *uræmia*, or inflammation of the kidneys or intestines. During the attack proper the patient may die in from six to eight hours; even in bad cases the usual time is, however, twenty-four hours.

Morbid Anatomy.—Cholera has no distinctive lesions; the cadaveric rigidity is, however, marked. In the digestive tract the isolated and agminated glands are swollen and prominent, more especially the latter. At the ileo-cæcal valve, a whitish-gray fluid with fine granules and cell nuclei exudes if the follicles are pierced. These changes are seen during the first forty-eight hours. Afterwards the swelling diminishes, and the glands are shrivelled up, collapsed, and of a yellowish or slaty-gray colour. The brain, heart, lungs, and liver are usually found healthy, while the kidneys are larger than usual, and congested.

Treatment is of two kinds—prophylactic and therapeutic. During a cholera epidemic all unnecessary meetings, fairs, and pilgrimages should be abandoned. The *materies morbi* being chiefly contained in the dejecta, all excreted matter should be disinfected by chemical agents, or destroyed by fire, and none should be so disposed of as to contaminate food or water. Wells ought to be inspected, defective sanitary arrangements remedied, dirt of every kind cleared away, the sale of unripe fruits and vegetables prevented, soup-kitchens established, and the stamina of the poor built up. The prodromic diarrhoea should, if cholera appears, be checked as early and speedily as possible by, according to Lebert, some preparation of opium, given either by mouth or rectum (F. 16, 17, 18). Should these fail, we must now fall back on, or as some eminent English authorities say, commence with, a teaspoonful of castor oil or rhubarb.

The therapeutic treatment of cholera, when it has actually begun, is very unsatisfactory; for the disease runs an extremely rapid course, and all medicinal agents are speedily rejected. Astringents are of no avail, and in fact do harm. While no distinct line of treatment applicable to all cases can be laid down, yet the following course of procedure should, if practicable, be adopted. The first two or three hours are those upon which everything may depend. The physician should, if possible, remain beside his patient or patients for an hour or two, having a pocket case containing morphia, hydrocyanic acid, and carbolic acid of the purest quality, and be ready to administer these as occasion may require. (F. 18a) will be found very useful. Three or four minims of carbolic acid should be added to each dose. The first dose is generally rejected, but a second dose given immediately afterwards is usually retained. If a case is seen early and is amenable to treatment, there can be no doubt of the benefit of carbolic acid. After being given for an hour or two at regular intervals, the vomiting ceases, and fluids are absorbed; the pulse reappears, and there is a reasonable hope of recovery. Ice should be

placed on the tongue every few minutes, and carbonic acid water drunk. Morphia may be injected subcutaneously to allay the pain and cramps, and sinapisms applied over the abdomen, while the legs are rubbed with some stimulating liniment. Should the temperature begin to fall, enveloping the patient in a blanket wrung out of hot water and sprinkled with turpentine, together with the internal administration of the same drug, was, in my experience, successful during the last London epidemic. In rapidly sinking cases brandy or champagne may be given (F. 72).

When reaction sets in, a large spoonful of good beef-tea may be taken every three hours, and later on, tea or coffee with milk several times a day. From this we may pass to a more increased and solid diet.

What is termed the saline treatment of cholera consisted in giving in the early stages a Seidlitz powder, and after this had acted, plenty of thin beef-tea well seasoned with salt; thirst being relieved by Seltzer, soda, or pure water *ad libitum*. By the treatment in this stage a cure was often obtained; if, however, the stage of cramp had been reached, a solution of chloride of sodium Di , sodii bicarbonas 3ss , chlorate of potass gr. vii. was given every half hour, by the mouth. If there were collapse and an imperceptible pulse, a strong solution of the same salts, dissolved in hot water at a temperature of 105° Fahr., was slowly thrown up the rectum. This line of treatment is still by some strongly advocated, and astonishing, though unfortunately only partial and temporary, rallyings from the stage of collapse have been recorded.¹

"The best treatment of cholera," says Lebert, "therefore, in the state of existing knowledge, is a carefully-regulated hygienic and a correctly-interpreted symptomatic treatment, with avoidance of all perturbatory efforts, in the last degree inutile if not even injurious."

¹ The treatment by inoculation with cholera germs to avert the true disease has not yet received professional sanction, and may therefore be considered as *sub judice*.

DIARRHŒA.

Diarrhœa is rather a symptom than a disease, yet, when the discharge from the bowels is great, special treatment may be required for its relief. The character of the stools varies. Thus, they may be fœcal, although "liquid," "bilious," "watery," "mucous," or "thin serous." Diarrhœa is a prominent symptom in typhoid fever, phthisis, various kidney, liver, or nervous affections. It may also result from dentition, errors of diet, influence of the season, malaria, or mental emotion. Sometimes it is "vicarious" and dependent on the rapid suppression of discharges or absorption of dropsical fluid. In all cases the stools should be carefully examined, as much information can thus be obtained with regard to the cause of the diarrhœa. A severe kind of diarrhœa, called by some *English cholera*, is accompanied by pains in the abdomen, cramp in the legs, and dark bilious evacuations.

Treatment will depend entirely on the cause. It is frequently inadvisable to check it, as it is nature's outlet for carrying away offending matter from the intestinal canal, or for relieving other organs which are diseased. Thus, if due to indigestible food, it is better to promote it (for this is the easiest way to stop it) by giving tincture of rhubarb or castor oil; if occurring in Bright's disease, it should not be interfered with, unless it produces great exhaustion. Should no direct cause be ascertained, it may be desirable to check it in whole or in part. The various preparations of opium or other astringents, as sulphuric acid, catechu, tannin, etc., are serviceable for this purpose (F. 16, 17, 20).

INTESTINAL CATARRH or DIARRHŒA is the commonest malady of infancy and childhood, and clear ideas as to its nature and treatment are essential to the practitioner. Following generally on exposure to cold, inflammation and active diarrhœa supervene, with much straining and spasmodic contraction of the bowels; there may be discharges of blood with the mucus, and there is often prolapsus of the bowel. The prostration is very marked.

The serious aspect of such a case is evident, and expectant treatment will be of little avail. Opiates alone may remedy symptoms, but they do not conduce to recovery. It appears essential that mercury should be combined with opium, and for this purpose (after the child has been put into a bath having a temperature of 100° F., for half an hour or longer, and then placed in bed or cradle, with a large linseed poultice to the abdomen) a powder composed of two grains of calomel and one of Dover's powder should be mixed, and if the child is under twelve months old, one-third should be given every four hours.

If the age is above twelve months, one-half the powder should be given, and repeated in six hours.

In the former case two powders may be sufficient—the administration of the third being left to the discretion of the medical adviser. Before the repetition of the powders the child should be placed in the bath for the time mentioned previously.

At the end of twenty-four hours a small dose of castor oil, with a few drops of tincture camph. co., may be administered.

The diet must be essentially of milk watered, or well boiled with arrowroot. Beef-tea or stimulants are not called for, and do harm.

DYSENTERY.

Dysentery consists chiefly in inflammation of the mucous membrane of the large intestine. The inflammation rarely involves the deeper layers, or extends past the ileo-cæcal valve. It is supposed to commence in the solitary glands that lie scattered over the surface of this portion of the intestine. These become enlarged and prominent, looking somewhat like small-pox pustules. They probably form the foci for most of the ulcers, which are sometimes narrow and oblong, lying across the gut; sometimes very large and irregular, with great patches of thickened mucous membrane. In tropical climates the liver is specially disposed to suffer, and ordinary or septicæmic abscesses may occur. So also the spleen and pancreas may be enlarged, softened, or indurated, and become the seat of abscess. The lungs may be similarly involved, and the bronchial tubes may be filled with puriform exudation, or fully-developed abscesses may be observed.

The site and extent of the ulcerations vary. The sigmoid flexure is a common site; the cæcum in certain cases and the rectum in others are principally implicated. In some severe instances the whole gut is covered with ulcers, while in fatal cases—Virchow's diphtheritic or gangrenous dysentery—the entire tract of the large intestine is a tattered mass of disorganisation, the natural appearance of the mucous membrane being lost. It is covered with

discoloured patches, with fibrous shreds, and commingled mucus, pus, and blood.

Dysentery not arrested in its early stage by treatment and not rapidly fatal is termed CHRONIC, and the condition is doubtless occasioned by structural changes in the bowel, i.e. thickening and imperfect cicatrisation of the ulcers and the permanently injured state of the glandular structures.

Dysentery may be either EPIDEMIC or SPORADIC. The former is peculiar to tropical climates, and seems dependent on a miasma emanating from the soil, attacking the system generally, and locating itself in the intestine; the latter may occur in all sorts of places, in adults as well as children, and is the result of the lodgment of masses of fecal matter in the lower bowel, which act as foreign bodies, giving rise to inflammation ending in dysenteric symptoms. In neither form is the disease contagious.

Symptoms.—Dysentery begins in both its sporadic and epidemic variety with diarrhoea, after there have been irregular stools or constipation. There are also lassitude, want of appetite, and a listless attention to ordinary occupations. On the third or fifth day, usually in the night, the diarrhoea becomes more severe, and attended with shivering or rigors. Pain is felt in the abdomen. The desire to go to stool is intense. Little feces after a time are passed, and there is a straining or burning pain at the anus and rectum (tenesmus). With the disappearance of the feces there appears bloody mucus, or pure blood, in the midst of which are often seen little white clumps, or round bits looking like minced raw meat.

The patient may seek to go to stool from twenty to thirty times in a night, and then, as might be expected, becomes giddy and faint from loss of blood and exhaustion. The disease may last in this acute form from six to eight days, with remissions in the morning and aggravations at night. As symptoms of amendment may be mentioned alternations of mushy even-formed stools with the characteristic bloody mucous ones. In very severe cases the tenesmus increases; the dejections flow uncontrolled, and

are largely mixed with blood, collapse sets in, and the patient dies of asthenia.

When the disease becomes chronic, it is very intractable, with frequent relapses, offensive discharges, and great pain and exhaustion. Sporadic dysentery generally terminates favourably. The mortality of the epidemic form may reach 40 or 50 per cent. In slight cases CONVALESCENCE is complete in about THREE weeks, medium severe cases in about SEVEN weeks. Severe cases, if they do not terminate fatally on the EIGHTH, or NINTH day, may last an indefinite length of time.

Treatment.—During an epidemic of dysentery all unnecessary crowding should be avoided, and uncleanness prevented. The discharges of the patient should be disinfectd. Potatoes, salads, unripe fruit, greasy food, spices, or pickles, should not be taken; while ripe fruit and stewed apples are advantageous. Flannel bandages should be worn round the abdomen; and if the bowels are constipated a gentle laxative of rhubarb may be taken.

Should an attack of dysentery set in, the patient must remain in bed in a room of an equal temperature. The diet should consist of milk, strong soup, yolk of eggs; the object of the dietary being to form small not bulky stools. Thirst is alleviated by meal-gruel, and the tenesmus by starch enemata, with 5 to 10 drops of laudanum in each. Leeches ought to be applied at the commencement of the attack to the anus, and afterwards, according to some continental authorities, what is termed the cathartic or laxative treatment adopted. Thus give an emetic of vin. ipecac., follow this up by castor oil or tamar Indien. On the second day they may be omitted, and morphia substituted in the evening. On the third day the laxatives mentioned may be administered again, and repeated on the fifth or seventh day (Heubner). Two grains of argenti nitras to four ounces of water are recommended as an enema.

Pulv. ipecac. in full doses forms the mainstay of English treatment; and there is no doubt, from the personal

experience of those who have seen the disease in India, that its effects are wonderful. Thus it is recommended to give 25 gra. of the powder, with a little syrupus aurantii sodii carbonas, to neutralise acidity. No fluid should be taken for three hours, although, if the thirst is great, ice may be sucked occasionally. In from eight to ten hours a smaller dose may be given, and, if necessary, repeated according to the urgency of the symptoms. It is advised, however, to give 10 to 12 grains at bed-time for a night or two after the stools appear healthy. As a rule, the system is tolerant of the large doses mentioned, and no sickness is produced.

Rest in bed or in the recumbent posture is also essential, and if there be abdominal pain or tenderness hot fomentations or turpentine stupes should be sedulously applied. It is generally found that under such treatment in the early stage of acute dysentery the pain diminishes, the tenesmus is relieved, the restlessness is abated, the fulness and desire to go to stool pass away, and the skin becomes moist. The motions also become fæculent, and assume a peculiar yellow appearance, significant of the action of the remedy. To combat any remaining irritability 10 to 15 grains of Dover's powder are beneficial; and should inaction of the bowels result from the treatment mentioned, small doses of castor oil may be given to aid in expelling mucus.

In the very severe forms the object is to prevent collapse; hence alcohol, interdicted in the milder varieties, must be given, and strong soups at frequent intervals. When the disease has reached the advanced stage of ulceration, and when its chronic character has been fully established, the ipecacuanha is not so specially useful. Other remedies must be tried. Of these vegetable astringents, such as tannin, rhatany, etc., are necessary. A teaspoonful of the liquid extract of bael is very useful. Residents in India state, that if bael fruit is eaten, wonderful results ensue in chronic dysentery which has resisted other forms of treatment.

Trousseau highly recommended subnitrate of bismuth,

in gr. x. doses ; or tinct. benzoin co. ʒss, tinct. catechu ʒss, extract hæmatoxyli gr. x., tinct. opii m. x., aquæ ʒi. This draught thrice daily. Turpentine stupes relieve tenesmus. An enema of

R̄ Ferri sulphatis gr. xx.

Glycerini ʒi.

Aquæ ʒvii. M.

is serviceable. If laxatives are necessary potass. bitart. is the best medicine. Above all, in chronic dysentery, change of air is very essential ; a sea voyage often acts admirably. The diet should also be bland and nutritious, rest should be enjoined, and from 4 to 5 grains of Dover's powder taken twice or thrice daily. A bandage should also be worn over the abdomen, and cold baths, with friction afterwards, taken if they are well borne.

SUB-GROUP 2.

BERI-BERI.

Beri-Beri is a disease of tropical countries allied to pernicious anæmia, as seen in Europe ; and characterised by anæmia, anasarca, effusion into serous cavities, great debility, numbness, paralysis of lower extremities, præcordial anxiety, pain, dyspnoea, scanty high-coloured urine, and in some cases drowsiness and sleepiness.

Beri-Beri occurs in an acute and chronic form—in the former case proving rapidly fatal ; the mortality indicating it to be second in Eastern diseases only to cholera.

Geographical Distribution.—This disease is seen in Ceylon as an epidemic, also in India, Malabar coast, Burmah, crews of ships trading in the Persian Gulf, Bay of Bengal, Red Sea, Singapore, Siam, and on the Australian Seas. On the west coast of Africa it is known as "The Sleeping Sickness."

Ætiology.—No definite cause can be assigned for the disease. It has been supposed that like chyluria it may be dependent on a worm, but none has as yet been detected.

So far as is known it may be said to be due to un-

defined causes of atmospheric or earthy influences, which depress the vital powers, impoverish the blood, and starve the nerve centres.

Symptoms. — The general symptoms are those of anæmia and anasarca, with collateral symptoms of pain at the breast, difficulty of breathing, heaviness of limbs, and paralysis. Death in acute cases results rapidly from symptoms of effusion into the thoracic and abdominal cavities, or within the skull occasioning exhaustion and syncope.

In slight non-acute cases the leading features are great depression, a tottering gait, scanty urine, cold skin, puffy face and neck; a burning sensation, of feet and calves of the legs, is a prominent symptom. Recovery from the non-acute or chronic form is frequent.

Treatment. — Prophylactic measures are good food, warm clothing, and strict attention to hygienic laws.

When the disease is established it can only be symptomatically treated, as by diuretics, diaphoretics, tonics, and stimulants. Hot air baths have been found to be useful. Mercury is to be avoided. A medicine termed "Oleum Nigrum" is given by Indian physicians thrice daily, and is said to act beneficially. Another native remedy is Treak-farook. Turpentine has also been advantageously prescribed.

The chief indications of treatment are, according to Dr. Jos. Fayrer, to promote removal of the œdema, to regulate the functions of the abdominal viscera, to increase the action of the skin, and to give tone and vigour to the muscular system.

ERYSIPELAS.

The term Erysipelas is derived from the Greek words, ἐρυν I draw, and πελας near. It is so named from its tendency to spread.

By erysipelas we understand an exanthematous inflammation, characterised by a redness, more or less acute, of the skin, attended with hardness and swelling, and terminating generally by resolution or desquamation, though

sometimes followed by suppuration, more rarely by gangrene.

It may be traumatic, following on a wound, or idiopathic, dependent on some disordered state of the constitution, and not due to any injury. In its latter phase it is a medical disease; and although it may be seen on any part of the body, it usually selects the head or face.

Like other exanthematous affections, it has a period of incubation; unlike them, however, the duration of this is not certain, but varies from a few hours to fourteen days. Five to seven days may be taken as an average.

It often sets in with chilliness and uneasiness rather than with distinct rigors; and is attended with loss of appetite, thirst, and fever, in nineteen cases out of twenty. This general feverish condition may last a few hours or a few days, and then its local phenomena are manifested in a redness of the skin, more or less circumscribed, accompanied by acute pain, which pressure augments. The temperature of the skin is increased at the particular spot, sometimes as much as three or four degrees.

The redness does not remain localised. It spreads from point to point. If it originates in the face, the scalp is invaded, and when such is the case the individual features are not recognisable. The distended eyelids obscure the eyes, the lips are swollen, the mouth is open, speaking is sometimes difficult or impossible, the nose acquires an enormous size, and the nostrils may be dry or obstructed by blood or mucus.

Usually after a fever of three or four days' duration, and in which a temperature of 105° may be reached, the redness fades, and the blisters or small vesicles which were formed in the course of the disease present a varying appearance; in some parts being dried into a crust, while in others their contents are not yet absorbed, but are undergoing absorption.

In other cases the vesicles become dark in colour, and the skin beneath them is converted into a grayish discoloured

slough. Suppuration and gangrene ensue, accompanied by a low typhoid state of the system, with increased temperature, extreme prostration, and a fatal issue.

It may also prove fatal by the extension of the inflammation to the brain or its membranes, by the blood-poisoning and malignant character of the disease, or by the glottis becoming so swollen as to induce suffocation.

Erysipelas is sometimes complicated with bronchitis, acute nephritis, and pneumonia. Most English authorities believe that the disease can be propagated by actual contact, or disseminated by means of fomites. Atmospheric conditions favour its occurrence, in what way we do not know. It has also been observed that where puerperal fever prevails there is a predisposition to erysipelas in the hospital wards.

It may be seen in infants, but after infancy it is rare until adult life. Acute attacks are most common from twenty to forty; asthenic, or less acute attacks, from forty to old age. The sexes are affected in equal proportion.

Diagnosis.—Erysipelas may be mistaken for scarlet fever, measles, or small-pox. The redness of scarlet fever is not, however, localised, and it is accompanied or preceded by throat complications. In measles there are nasal and catarrhal symptoms. A developing small-pox pustule may simulate it, but a small-pox pustule is not solitary; others may be seen in different parts of the body, and there are premonitory symptoms in small-pox, such as vomiting and pain in the back.

Erythema and erysipelas have one feature in common, viz. redness; but they differ in this, that in erythema there is no fever, premonitory or co-existent; there is no inflammation of the deeper-seated parts of the skin; there is no vesication; there is no tendency to implicate the lymphatic glands, and it does not peculiarly affect the face or head.

Treatment.—The patient, if possible, should be placed in a cool, well-ventilated apartment, and should be freed from all sources of irritation, either by officious nursing or fussy friends.

The medicinal treatment may be fitly commenced by a calomel and jalap purgative (F. 23). Then give tincture of steel, in 30 or 40 minim doses, every three hours, until the fever is lowered. When convalescence is certain, diminish the doses to 20 minims thrice daily for two days; after that give bark (F. 76) (F. 79).

In erysipelas, the result of wounds or surgical operations, tincture of aconite in five minim doses every four hours has a deserved reputation in lowering the temperature and abating the progress of the disease.

If the cerebral symptoms are grave, cut away the hair; and if the throat is implicated, let steam be inhaled, and the throat be painted with tannin and glycerine (F. 49).

The principle of all local applications consists in protecting the part affected. The old plan was to dust with flour, and cover with flannel; now oxide of zinc and starch are used, as being less clagging to the skin, and more soothing. After applications such as these, it is unnecessary to be too curious in removing the coverings to see how things are getting on.

As a more perfect covering, a mixture of castor-oil and collodion has been recommended, or painting the whole surface lightly with the nitrate of silver in solution, or with the solid stick.

In erysipelas of the leg it is advisable to draw a line of demarcation with the solid nitrate of silver on the healthy skin. This encircling band prevents the disease spreading beyond it.

Dr. Wood is in favour of tincture of iodine as a local application.

SYPHILIS.

Syphilis is a chronic infectious disease, with different symptoms at different stages of the malady. As a separate and distinct disease, syphilis dates from the end of the fifteenth century, when a notorious epidemic of it occurred in Italy, which gradually became less malignant; and the physicians then inferred, falsely, as we now know, that it would wear itself out, and cease altogether to

infect the human body. The disease is at the present day prevalent throughout the world, although its principal sites, for obvious reasons, are large seaport towns and great commercial centres.

The most common way by which syphilis can be communicated is by the genitals, as the result of sexual connection. A little red papule appears, followed by hardness and induration. A few days after this the lymphatics of the groin are enlarged, become hard to the touch, without tenderness, and freely movable beneath the skin. Shortly after the affection of the lymphatics, the papule is seen to be scaly or covered with a thin crust, which, when removed, discloses a shining surface of a bright red colour, with a scanty secretion. Meanwhile, the patient begins to feel weak and somewhat indisposed, and in the course of from six to eight weeks from the appearance of the papule, an eruption is observed on the skin, of a red colour and unattended with itching.

This is the commencement of constitutional syphilis. Simultaneously with the red eruption, or shortly afterwards, the throat begins to be inflamed; the inflammation leading to ulceration or to the production of circumscribed flat growths on the mucous membrane. There are frequently also more or less baldness, affections of the nails, pains in the bones, inflammation of the iris or of the deeper structures of the eye.

Now, the disease properly treated may take a favourable course, with disappearance of the symptoms and restoration to health in from ten to twelve months from the time of infection. But in the majority of cases new crops of eruptions come and go on the skin and mucous membranes; and thus we have small papules on the tongue, and scaly isolated patches of psoriasis on the palms of the hands or other parts of the body. If the constitution is weak and scrofulous, eruptions tending to suppurate may be developed. These become encrusted and form ulcers, which finally heal by cicatrisation.

Severe ulcerations may also be developed in the throat and nasal cavities, in which latter the bones may be

laid bare and the nose become permanently depressed. Tumours may form in various internal organs, especially the liver, the testicles, and the brain, and from the semi-translucent aspect which they present, especially in the quite recent state and at the growing edges, they have been termed "GUMMATA." These "gummata" are not of the nature of an exudation, but consist of hyperplasia, increase of connective tissue elements. This increase begins in the walls of the vessels, and although at first soft and translucent, it afterwards becomes firmer and tougher, and dries up. Phthisis may now begin, with albuminuria and dropsy due to amyloid degeneration of the kidneys.

Constitutional syphilis may also be communicated from local secondary lesions, as by kissing, etc., by syphilitic nurses, by vaccination when blood is taken along with the lymph of the vaccine vesicle, etc.

The syphilitic cutaneous affections may be of various kinds; probably the squamous variety is the most common, appearing in patches of a coppery colour, and having the scurf renewed as fast as it is shed.

These eruptions may generally be diagnosed as syphilitic by the fact that they do not itch; by their dull coppery colour; by their more or less circular form and grouping; and by the brownish coloration the severer forms leave behind. Syphilis is often communicated to the infant through disease of either parent. In such cases, within a few weeks or months, an examination of the nates will reveal mucous tubercles, or red patches at the buttocks, ankles, or hands. Fissures may also be observed at the lips, nose, or angles of the mouth. The child also presents, if no treatment has been adopted, a pinched, young-old appearance; the skin hangs in loose folds, and there is a history of characteristic snuffles from birth, accompanied by a peculiar hoarse cry. As the result of this congenital syphilis the upper central incisors of the permanent teeth may have a peg-shaped form and notched appearance, and one or both eyes may be affected with a lingering inflammation of the cornea (Keratitis).

Treatment.—It is doubtful if the initial lesion can be destroyed at the seat of infection, opinions varying on this important point. Experience testifies that all treatment of constitutional syphilis is futile without the aid of mercury. How this remedy acts we cannot tell. There are five modes of employing it:—

1. By inunction; rubbing in some ung. hydrarg. every night, after washing the part with soap and water, and stopping the remedy whenever the mouth becomes in the slightest degree affected.

2. By fumigation; 8, 15, to 20 grains of calomel being employed for this purpose. The patient, undressed and enveloped in a blanket, being seated on an ordinary cane-bottomed chair, the calomel, placed on a small metal vessel below which a spirit-lamp is burning, is evaporated in about fifteen minutes and deposited on the skin. This method may likewise be continued daily, until slight mercurialisation is produced.

3. By hypodermic injection of the perchloride. The solution used may be made by dissolving a grain of corrosive sublimate in one hundred minims of glycerine and water, mixed in equal proportions; and of this from four to seven minims, containing respectively about the $\frac{1}{25}$ and $\frac{1}{15}$ of a grain of the mercurial salt, should be injected once daily. This injection sometimes causes considerable pain and pustular inflammation. A better method is to dissolve two grains of the perchloride in sixty minims of water. Then add to this solution forty minims of a filtered mixture of one part of white of egg and two of water. An albuminate of mercury is formed, which again is rendered soluble by the addition of a small quantity of a saturated solution of chloride of sodium. A clear solution is thus obtained, and of this three minims may be injected twice daily, equal to $\frac{1}{24}$ of a grain of the perchloride. If five minims are used improvement on the syphilitic eruption will be manifested in a few days, and this without pain or any inflammation. The most appropriate places for injection are the back and sides of the thorax. This method is accurate. It is

cleanly. It acts rapidly without causing salivation—about four weeks being sufficient to effect a disappearance of the symptoms.

4. By mercury being given in small dose, with Zittmann's decoction which contains sarsaparilla and other herbs (F. 8b).

5. By mercurial preparations internally, that one being chosen which can be continued for the greatest length of time without producing digestive derangements.

Thus pil. hydrarg. is good, or hydrarg. c. creta, or the perchloride in the form of a pill, or in a mixture in doses of $\frac{1}{16}$ of a grain (F. 1, F. 3) thrice daily. The famous liquor of Van Swieten, still largely used in France, was made by dissolving one grain and a half of corrosive sublimate in three fluid ounces of corn whisky, which can be replaced by any other strong spirit, such as rum or brandy. The dose of this solution is from one to two fluid drachms, twice daily, after meals. Iodide of potassium should be given alone for a considerable time afterwards. This remedy is specially serviceable in pustular eruptions and affections of the bones in the secondary and tertiary manifestations of the disease. If there is much anæmia, it may be combined with carbonate of ammonium or ammonio-citrate of iron. Condylomata are best treated locally by dusting calomel or iodoform over them. For Keratitis, my experience at the Glasgow Eye Infirmary induces me to speak highly of small doses of hydrarg. c. creta and quinine, with the local application at first of atropine and subsequently of dusting with calomel.

Some cases of syphilis seem to resist all treatment at home, and in these cases the patient should be recommended to proceed to Aix-la-Chapelle or Neuenahr. Undoubted and permanent benefit ensues from the inunction of mercury assisted by the sulphur baths at these spas. In six weeks a cure may be accomplished.

The patient should avoid sudden changes of temperature, go to bed early, and wear flannel. Beer and wine may be allowed, but no spirits. The teeth should be brushed daily with tincture of myrrh or chlorate of potass. The diet should be nourishing.

SUB-GROUP 3.

HYDROPHOBIA.

The term hydrophobia was first used by Celsus, and simply expressed one prominent feature of an affection, the pathology of which has ever remained obscure, viz. dread of water, or, it may be added, of liquids in any form. It is the result of the implantation of a specific virus; this inoculation taking place most frequently from the bite of a rabid animal, especially the dog. The skin must be wounded; the spontaneous development of the disease is never known. Wounds so occasioned are more dangerous on the hands and face than on the lower extremities, probably because the clothing worn intercepts the virus.

After the infliction of the wound there is a stage of incubation, varying from six weeks to as many months, during which time the wound heals perfectly. After this a peculiar prickling sensation is felt over the site of the cicatrix, accompanied with general symptoms of restlessness, depression, and disturbed sleep. On these supervene the terribly significant phenomena of dread of liquids and intense thirst. As the disease progresses all attempts to drink are avoided. The sight even of a drinking-vessel containing water is intolerable, and the patient turns away his face, shrieking out at the slightest touch or breath of air. The muscles of the neck and trunk, and even the whole muscular system, contract spasmodically, with convulsive trembling of the limbs; at times, during the frenzied fits, snapping motions are made with the jaws, like biting. Although during the convulsions mental hallucinations occur, yet, in the temporary cessation from these, the patient responds correctly to questions, begs friends not to leave him, and, with a consciousness of impending death, may ask them to pray for him. The saliva is now greatly increased in quantity, and, as it cannot be swallowed, is ejected in all directions. The respiration is hurried, and accompanied with a sigh-

ing sob. This state may continue from one and a half to three days, and is succeeded by a stage of paralysis lasting two to eighteen hours, with an abatement of the distressing symptoms, but greatly increased weakness, which deepens into death. The skin is covered with a clammy sweat, pulse small and irregular, saliva running from the mouth, and accelerated breathing.

The duration of the disease in hydrophobia is only from two to four days. It always terminates fatally.

Treatment.—This is of no avail, although many remedies have been tried; yet humanity dictates the removal of every cause of excitement, the separation of the patient from everything calculated to disturb or render him anxious, and the maintenance of the strength by nutritious enemata during the temporary abatement of the spasms, or while under the influence of chloroform. I treated three cases of hydrophobia with pilocarpine injections. I was satisfied so far with the treatment; it diminished the spasms and reduced the severity of the symptoms. One patient could drink water. Sleep, however, was never obtained, and death seemed to occur through exhaustion. Recent experiments, in Paris, show that inoculations of hydrophobic virus diminish or prevent the risk of any infection from rabid dogs.

TETANUS.

Synonym—Lock-jaw.

Tetanus may be either idiopathic or traumatic, and, speaking generally, in both cases seems essentially to consist in an inflammatory affection of the spinal cord. It is one of the most fatal of maladies, and in its idiopathic form appears to be induced by exposure to cold or damp, especially in those who have suffered from wounds; it has also apparently been caused by worms, by abortion, and by diseases of the womb.

The first symptom is pain in the epigastric region, extending backwards to the spinal column, and due to spasm of the diaphragm. Succeeding this are stiffness of the

throat, fixedness of the jaws, and difficulty of swallowing. Sooner or later there follows tonic, *i.e.* continuous, spasm of the neck, back, and loins, causing the body to assume the form of an arch (*opisthotonos*). The skin is hot, the temperature high, from 105° Fahr. to 110° Fahr. ; wakefulness, thirst, and constipation are also prominent symptoms. Strychnia poisoning may be mistaken for tetanus, but it is distinguished from it by this, *that there is no epigastric pain, spasms are more rapidly developed, and do not commence in the jaw.* The average duration of the disease is from three to five days. Hopes of recovery may be entertained if it extends over a week. Death results from apnoea or exhaustion.

Treatment.—This is very unsatisfactory. The favourite remedies, however, are Calabar bean, aconite, chloral, bromide of potassium, opium, and chloroform.

GLANDERS—FARCY

are varieties of one and the same disease, glanders being the result of the poison from horses introduced into the human system by the respiratory passages, while farcy depends on direct inoculation by the bite of the horse on the trunk or limbs. Glanders is rare, and may be said only to attack men attached to stables as coachmen or grooms.

The distinguishing feature of glanders consists in peculiar nodular formations, varying in size from a pin's head to a hazel-nut, which appear on the mucous membrane of the nose, throat, and mouth, on the skin, and in some internal organs. These formations, composed of cells, rapidly break down, and suppuration and abscesses ensue. The lymphatic glands are enlarged.

In "acute farcy," depending on direct inoculation on limbs or trunk, the symptoms are aggravated, and proceed from the local centre where the wound has been inflicted. Thus the lymphatics in the neighbourhood become inflamed, and this is followed by various nodular enlargements and abscesses. The eruption is often absent, and

there is no discharge from the nose. Farcy may also, but rarely, be seen in the "chronic" form.

Necessarily the prognosis in the acute forms is very grave; recovery being the exception. In the chronic there may be hope after a prolonged and debilitating illness.

Treatment.—All that can be done is to give stimulant and nutritious diet, and administer iron and quinine in large doses internally. The sores will demand local treatment.

SPLENIC FEVER.

Synonyms—Woolsorter's Disease, Charbon.

Variety—Malignant Pustule.

This is a specific contagious disease, communicated to human beings by disease of horned cattle, horses, and sheep, and dependent on the presence in the system of the bacillus anthracis. Two chief forms are recognised.

1. Local or external.—This form is exhibited as carbuncular swelling, having specific characters, and resulting in more or less constitutional symptoms. The disease is often fatal.

2. General or internal.—This form affects internal parts, and may be evidenced by no external pustule. It is the result of indirect contagion. The virus being absorbed into the system in connection with certain trades, hence the name of "woolsorter's disease;" its occurrence in some countries is designated "Siberian plague." This internal form is identical with splenic fever of the lower animals, and the symptoms are those of blood-poisoning. The *post-mortem* features reveal scattered hæmorrhages in various organs, diffuse cellular exudations, congestion of the lungs, and a disorganised, pulpy, swollen condition of the spleen.

Splenic fever affects horned cattle, sheep, and horses, in all parts of the world, and sometimes assumes an epidemic type. It presents usually a local swelling near the seat of inoculation (*e.g.* the mouth and pharynx),

and general symptoms of blood-poisoning. In animals dying of this disease the spleen is found to be greatly swollen and pulpy, sometimes even ruptured, and there are hæmorrhages into various other organs. All parts of the animal dying of the disease, dependent on the specific bacillus anthracis, may communicate the disease either directly or indirectly, direct contagion being seen in butchers, slaughterers, tanners, indirect in those who have to deal with the wool and hair of animals which have died of the disease, as woolsorters, woolpickers, horse-hair cleaners, furriers, and tanners. The poison may also be communicated to human beings by drinking water infected by the contagion.

The bacillus, as seen in the blood, consists of a motionless short rod or filament, in length averaging from $\frac{1}{2500}$ inch to $\frac{1}{1200}$, and in breadth $\frac{1}{18000}$ part of an inch. It seems to multiply in the blood by transverse fissure. The bacillus requires for its growth the presence of a nitrogenised—perfectly albuminous—pabulum, and a supply of oxygen. Its vitality is destroyed by a temperature of 60° C.

Symptoms.—The symptoms vary with the form of the disease, and at least two distinct types are recognised.

1. Malignant pustule, or carbuncle proper, is seen as a primary lesion on the face, neck, hand, or arm, parts most exposed to direct contagion. It commences as a red pimple, develops into a papule, and then into a vesicle, which bursts, leaving a brown eschar seated on a dark indurated base. Edematous swelling of contiguous parts is observed, the entire side of the face or head being swollen and lymphatic glands enlarged.

The constitutional symptoms are evidenced by great prostration, physical and mental, cold sweats, sometimes diarrhoea, followed by delirium and coma. Death may occur in thirty or forty hours from the first appearance of the pustule, or it may be delayed for four or five days. Mortality is about one in three. Healing of the pustule may take place by sloughing, or by the eschar separating and the wound granulating.

2. Internal anthrax may either be general, having no special lesion, or it may be accompanied by local affection, usually of the lungs or intestines. The most noticeable features of the disease, after the incubation stages of two or three days are past, are intense physical prostration, mental depression, coldness of the extremities, impeded respiration, and generally rapid collapse. The temperature is sometimes high, 105° Fahr. ; usually it is very little elevated. In the internal form, where the pulmonary tract is chiefly involved, the symptoms resemble those of bronchitis or pneumonia, with, however, an amount of prostration and cyanosis out of proportion to the local signs of these maladies. In the intestinal form the prominent symptoms are vomiting, difficulty of swallowing, colic, and diarrhoea.

Death may occur in either of these varieties of the disease in twelve hours, or it may be delayed to two or three days.

Treatment.—The success of any local treatment depends upon the early detection of the disease in its papular or vesicular form. Excision and cauterisation should be at once resorted to, the part being cut into by a free incision, and followed by the use of carbolic or fuming nitric acid. The statistics of recovery, when these means are speedily resorted to, are very encouraging. The general treatment is stimulant, quinine being given largely with ammonia, ether, and alcohol. The air should also be impregnated with carbolic acid spray.

Prophylactic measures are strongly indicated by the nature of the disease, and the carcasses of animals dying of anthrax should be burnt and thoroughly destroyed. The law in France and Germany is stringent, in Britain it is much less rigorously enforced.

*DISEASES PRODUCED BY ERRORS OF
DIET.*

SUB-GROUP 4.

OBESITY (obesus, corpulent : from *ob*, by reason of, and *edo*, I eat).

Synonyms—Corpulence, Polysarkia.

As phthisis literally means a wasting of the body, so obesity expresses the opposite state of extra-nutrition. It is characterised by an excessive development of adipose tissue, more especially in those situations where normally it is abundant, viz. subcutaneous, subserous, and inter-muscular connective tissue.

As predisposing causes to obesity may be mentioned heredity, sex, and age. Excessive corpulence is more common in women than men, and generally occurs at the change of life, viz. 40 to 45 years. Race and climate also play their parts in obesity. The Hottentot and Hindoo, of eastern races, the German, the Jew, and the Greek, of European races, become obese. While predisposing causes must be borne in mind in considering obesity, yet without doubt determining causes are more potent factors. Thus, excess of food and drink will lead to corpulence in those who are hereditarily inclined to it, or who are prevented by occupation or business from taking sufficient exercise to promote the oxidation of the tissues.

The fat of the body of an average male adult constitutes about one-twentieth, and in the female rather more, of the total weight ; but in extreme cases of obesity one-half or four-fifths of the body weight may be fat. The symptoms of obesity need scarcely be alluded to, except in so far as they bear on the treatment of the disease. Muscular energy is diminished by the fatty infiltration of the muscular tissues, and hence bodily exercise is avoided, and, if taken, may cause at first considerable dyspnoea and palpitation. The digestive process, through the strain thrown on it by excess of food, becomes impaired,

and flatulence and constipation, or acidity and diarrhoea, may at intervals supervene.

The urine is generally acid, contains uric acid, and often, though in small quantities, sugar. The vessels share in the malnutrition of the body, and atheroma of the arteries is often found, while the veins become distended and varicose, forming hæmorrhoids and varicocele. The obese person, even more than the one who is thin, is liable to attacks of acute diseases, and from the general weakness of the tissues these generally run a very unfavourable course.

Excessive corpulence should give rise to a grave prognosis, for rarely do very obese persons reach advanced age. They may be cut off by an intercurrent disease, or die from the disease itself by syncope, from a fatty heart; by apoplexy, from the degeneration of the intra-cranial arteries; or from bronchitis, resulting from cardiac dilatation.

Treatment.—Avoiding anti-fat nostrums, the corpulent person should carefully study diet. He should not take fatty and starchy food. Lean meats, sweetbreads, fish, except salmon and eels, clear soups, poultry, eggs, game, cheese, green vegetables, toast, gluten bread, fresh fruit, and pickles are allowed. On the other hand, potatoes, sweets, sugar, carrots, butter, and fat meat should be eschewed.

The less liquid taken the better, even water should be drunk in small quantities, and not with, but after, meals, say half to one hour. Alcohol in any form, but especially in beer, porter, champagne, port and fruity wines, assists corpulence. Tea and coffee are supposed to interfere with tissue change, and therefore should be taken sparingly. The same remark applies to milk, which to a great extent is inadmissible from the fat which it contains.

Exercise must be taken. Nine to ten miles or more of walking exercise are essential, no matter what the state of the weather may be. Riding, rowing, and gymnastics are of great benefit. Cold sponging of the body when the feet are kept in warm water should be a part of the morning toilette.

Those whose circumstances permit them should pay yearly pilgrimages to Marienbad, Kissingen, Carlsbad, or Ems. There is no doubt that the alkaline aperient nature of these spas, with the restricted dry diet, will in the course of a few weeks materially diminish obesity. Iodides and alkalies for those who cannot go to these spas must be given in relatively large doses.

The preparations of sea-weed, which form the basis of most extra-pharmacoepial fat remedies, sometimes do good, but this depends on the iodine they contain.

SCURVY.

Scurvy is a disease of great antiquity. It is alluded to by Pliny, and at different times it has proved very fatal both by land and sea. It is essentially dependent on the want of fresh vegetables as an article of diet, and although it has frequently occurred on land, it is pre-eminently a sailor's disease. Other causes than that mentioned may predispose to the disease, such as great privation, bad food, a marshy soil, and defective hygienic conditions; but these by themselves will not specially originate it. That which produces scurvy is essentially the want of a vegetable diet.

While thus aware of the cause of scurvy and the means of preventing it, we are ignorant of the exact changes which it originates in the system. Different statements have been recorded by different observers. The blood seems to undergo some change. Older writers stated that the blood deposited a black, muddy sediment, subsiding from a reddish serum. Later writers explain the thickened crassamentum by stating that the cohesive power of the fibrin is so much lessened as to prevent its being separated from the red corpuscles, and that this probably explains the meaning of the terms, so often mentioned, "agglutinated blood" and "thickened crassamentum." Dr. Garrod views scurvy as essentially due to the want of potash salts in the blood, through the food being deficient in them.

The symptoms of scurvy are well marked. They come on gradually with weakness, anxiety, bad breath, a sallow muddy complexion, and the appearance of blotches on the legs. Some pains of a wandering character are felt all over the body, while the temperature is lower than normal, an evidence of deficient vitality.

As the disease advances, the gums become swollen and spongy, bleed on being touched, and are said to present an appearance similar to that seen when a patient is salivated. As the disease reaches an advanced stage the teeth rot from the socket, and hæmorrhage takes place from the mouth, nose, stomach, and intestines. The debility becomes extreme, and petechiæ, developing into ulcers or ecchymoses, form on the lower extremities.

A friend who was much exposed to Arctic privation, and who was surgeon to a ship when a fatal attack of scurvy broke out, thus describes the disease:—

“The men were listless and dispirited before there were positive indications of scurvy. They could scarcely drag their legs along, and were unable to go aloft, or, if they did so, this was attended with great pain and marked debility. The pain seemed rheumatic in its character, and was always worst at night. The countenance was sallow and muddy long before the actual manifestation of the disease. The pain was at first confined to the extremities, and upon these the effusion of blood first occurred, generally in the form of small petechiæ, which afterwards developed into vibices, and sometimes into ecchymoses. A bruise, a rebound from a rope, or any small injury, occasioned a steady development of an ulcer. Sometimes there was extensive and diffused infiltration beneath the subcutaneous and intermuscular areolar tissue.

“The limbs, especially the calves of the legs, then became as hard as a board, while above the induration the skin was either immovable and unaltered in colour, or had blood suffused under it.

“When a fatal termination ensued, it either did so from extreme exhaustion or general dropsy, unless the

patient was cut off at an earlier stage by pleurisy, pericarditis, or profuse bloody diarrhoea."

Pathology.—The pathology of scurvy is not well understood. It has been supposed that the disease depended upon a deficiency of potash in the system, because potash in the urine of patients suffering from scurvy is markedly diminished. But this theory is negatived by the fact that large quantities of beef-tea, containing a great quantity of potash, fail to cure the disease, so also does the administration of the salts of potash. The probability is that scurvy is due to an increase of the chlorides in the blood, and especially chloride of sodium, at the expense of the alkaline salts. The excess of chloride of sodium causes the blood-corpuscles to pass out of the vessels, and leads to extravasation and ecchymoses, which form prominent symptoms of the disease.

Treatment.—Lime juice, by its constitution, is supposed to have a decided action in preventing scurvy, which is now rarely seen except at sea. Hence, the mercantile marine and navy regulations of this country advise the administration of the juice in ounce doses daily, commencing ten days after the vessel has left port. Like many others, I implicitly accepted this statement as a truthful therapeutic canon, and in former editions of this book I inferred that it was a breach of the regulations mentioned which produced scurvy. As the result, however, since then of a number of official inquiries, instituted by the Board of Trade, and conducted by me at Greenock, in outbreaks of scurvy occurring on homeward-bound vessels, I have been compelled by the evidence produced to question the efficacy of "preserved lime juice" as an antiscorbutic. The following facts were gathered from the inquiries in question: "that the juice would neither prevent scurvy originating, nor cure it when it had begun, during long and protracted voyages."¹

The inquiries mentioned were chiefly concerned with ships sailing from various ports of the United Kingdom

¹ As mentioned in reports sent to the Board of Trade at different inquiries.

to Java or Maulmain, and they carried from the port of embarkation sufficient lime juice—fortified by 11 per cent of alcohol—to last them on the outward and homeward voyage. No case of scurvy occurred on the outward voyage, but it was on the return voyage, and about a month or six weeks after leaving Java or Maulmain, that the outbreak commenced, and invariably attacked at first men who seemed to be out of health. Strong men, however, towards the end of the voyage, were not exempted from the disease. In some cases the scurvy proved fatal, in others it completely disabled the men from active work. I found that the lime juice was not deficient in quantity, that it had been carefully served out according to the regulations, and that even the quantity had been doubled and trebled to the men who were sick, in the vain hope, as it proved, of arresting the disease. The lime juice was found on all occasions but one to be good, and in that one, it was certainly decomposed, and unfit for human use, as was testified by the city analysts of Glasgow.

The dietary of the ships so infected, as shown by the provision list, the log-book, and the evidence of the captain and sailors, was unvaried, and consisted simply of salt meat and biscuit, as ordered by the mercantile marine regulations. The meat was found to be wholesome in character, the biscuits unmoulded, and the water pure and good; but the monotonous nature of the diet seemed to be the real originating cause of the scurvy, and the extra allowance of lime juice given, when the men were attacked, failed in every case to arrest the disease, or even to mitigate the symptoms. When they reached port and obtained fresh provisions the improvement was marked and rapid. I am bound to tell this fact, that all the ships were "temperance ships," and that no grog was served out at any time to the men, a result which many captains in the merchant service believe to be a prominent cause of originating scurvy.

The vessels of all other countries but our own rely for the prevention of scurvy on a varied diet, consisting of a liberal supply of preserved vegetables, as well as animal

food, and the result of this is, that on their vessels scurvy is an almost unknown disease. Were our ships prevented from proceeding to sea unless they had a due supply of preserved vegetables, sufficient to give them a varied diet, both in the outward and homeward voyage, it is to be inferred that they would have the same immunity, and that outbreaks of scurvy would be unknown in the annals of our mercantile marine. I would only add as a query for investigation—Is the lime juice sufficiently fortified by 11 per cent of alcohol to retain the antiscorbutic properties, which undoubtedly it possesses when fresh, during a long voyage, chiefly in warm latitudes?

From the description of scurvy, and its causes, there are certain obvious indications for treatment. Rest is necessary, and the low vitality of the patient requires this rest to be in a warm atmosphere. Antiscorbutics should be administered, such as potatoes, new lime juice, oranges, or the FRESHLY-squeezed-out juice of water cresses, mustard, or horse radish. The extract of these latter plants is useless.

The diet should consist at first of soups and milk; afterwards, when the digestion has improved, fresh meat and vegetables should be given.

As a local treatment for the ecchymoses and infiltrations, lotions and compresses of aromatic vinegar and spirits of camphor have a high reputation.

Dr. Garrod's theory indicates the administration of the tartrate or chlorate of potash, to prevent or cure the disease. The barm of beer is also highly commended, and of this six or eight ounces may be taken daily as an antiscorbutic.

DELIRIUM TREMENS

may be defined as alcoholic poisoning, attended with a delirium in which there are great restlessness, suspicion, trembling, and various delusions.

Etiology.—The disease is caused by the abuse of alcohol. Distilled spirits more surely than wine; wine than beer. The man, it may be added, who, with a

highly-wrought nervous organism, drinks to excess to drown the consciousness that he is drinking, is more likely to be affected with delirium than the habitual drunkard, who may drink to excess, but is able to sleep it off.

Symptoms.—Sleeplessness is the most characteristic symptom, and this sleeplessness is associated with busy restlessness, a chattering tongue, fidgety hands, and imaginary spectra. The tongue is protruded in a tremulous way, as in fever, but it is not brown and parched, but moist and creamy. The pulse is soft and compressible; the skin often bathed in perspiration.

The patient may reply coherently to a question or two, but soon after relapses into the fancies characteristic of the disease. These fancies are not pleasant, but associated with the lowest and most repulsive forms. Thus rats, mice, serpents, and imaginary demons, are crawling about him, and in endeavouring to escape or to destroy these his mind is sorely tried. Often he peeps suspiciously behind the curtain, draws the bedclothes over him, or attempts to leave his bed. Cowardice rather than violence is exhibited both with regard to himself and his actions towards others.

The disease tends to recovery, on the third or fourth day, by a sleep from which the patient awakes refreshed. In fatal cases the symptoms are aggravated, and attended with intense watchfulness, low muttering delirium, sub-sultus tendinum, and great exhaustion.

Pathology.—The subarachnoid tissue has been found so infiltrated with fluid as to raise the arachnoid above the level of the convolutions. The cerebral arachnoid may exhibit considerable opacity all over the hemisphere, and the ventricles may contain a small amount of fluid, while the cerebral arteries and other parts of the brain are perfectly healthy.

Treatment.—The objects in treatment are, to prevent the further introduction of the poison into the system, to quiet the nervous excitement, and to sustain the strength while the accumulation of alcohol is being thus eliminated from the system.

To fulfil these indications, all stimulants should be forbidden if the patient is young and strong. If there is a history of previous attacks, and the patient is weak, it is advisable to withdraw them gradually.

If the patient can be persuaded to take some beef-tea or chicken soup, there is not much danger in the disease nor necessity for medicinal treatment. If, as often happens, there is loathing of food, it seems advisable to place six grains of calomel on the back of the tongue. The liver is thus stimulated to action. In young subjects opium may not be necessary, but in old subjects opium with some stimulant is the best remedy. Thus 40 or 60 minims may be given of tincture of opium, and it should be repeated at intervals of six, four, three, or even two hours, until its effects have been produced, and then every twelve hours. The patient, while under its influence, should be carefully watched. Some prefer to give it with antimonial wine (F. 70); or, should the stomach be irritable, to substitute hypodermic injections of morphia. In whatever form the remedy is administered, it must be remembered that the object is to produce sleep; yet if the pupils are contracted under its use without sleep, it has been pushed far enough and its use should be discontinued. In young subjects, provided there is no obstructive heart disease, chloral acts well. Thirty grains may be administered in a draught, and may be followed in two hours by the same dose. Should no sleeping effect be produced, and should excitement be more marked, it is inadvisable to continue it. Many prefer to continue it in smaller doses with the bromide of potassium (F. 69). Nourishment as indicated should be given often and cautiously (F. 69, 70).

All force, as in the form of strait jackets, should be discountenanced. The services of well-skilled attendants, combined with kindness and humouring of the fancies, seem to be sufficient, even in the most violent cases. It is well not to restrict the patient from reasonable muscular exercise, as this conduces to sleep and appetite.

DISEASES NOT CLASSIFIED.

RHEUMATISM.

The word *rheumatism* is derived from *ρευμα*, a fluxion, and the disease arises from some disordered or abnormal condition of the blood. Its frequency has attracted the attention of physicians both in ancient and modern times, and much speculation has been excited as to what causes operate in determining its predisposition for the white fibrous tissue which enters into the composition of sheaths, fascia, fibro-serous membranes and ligaments, and thus in particular affecting the joints. The heart and its coverings, moreover, are often implicated.

It is believed that the poison circulating in the blood is lactic acid. Dr. Prout first pointed out that the blood contained a superabundance of this acid; and Dr. Richardson's experiments indicate that the injection of a solution of seven drachms of lactic acid to two ounces of water into the peritoneum of a cat induces not peritoneal but endocardial inflammation (especially of the left side of the heart), and fibrous deposits on the mitral and aortic valves.

The starchy matter of the food is supposed in health to be changed into lactic acid, which then combines with oxygen to form carbonic acid and water, in which state it is excreted. If this oxidation does not take place the lactic acid accumulates in the system and rheumatic fever results.

The fibrin appears to preponderate over the saline elements of the blood during the disease. Few opportunities have been afforded of examining the state of the parts affected when the attack is acute, as few people die of rheumatism *per se*; hence the somewhat contradictory statements of different authors.

Senator's opinion as to the cause of acute rheumatism is interesting and instructive. In active muscular exer-

cise lactic acid is chiefly formed and excreted by the perspiration. As the result of a sudden chill after such exercise acting on the peripheral expansion of the centripetal nerve fibres, this excretion is arrested, and lactic acid accumulates in the system, forming the *materies morbi* of acute rheumatic fever. He supports this by stating that lactic acid, given internally for diabetes, has in two well-recorded instances occasioned acute rheumatism. That rheumatism does not follow a Turkish bath he accounts for—*1st*, By stating that the perspiration coincident with the bath is only condensed watery vapour, not similar to that connected with active exertion; and *2d*, The friction, and shampooing, and gradual cooling down, prevent the untoward results which might otherwise accrue.

Rheumatism is most conveniently divided into acute and chronic. In the former, the general and local symptoms are well marked. There is usually a feeling of coldness, want of appetite, thirst, and more or less feverishness, attendant on or caused by exposure to cold or wet. Pain is experienced in one or more joints, and is followed by inability to move, and by swelling and great tenderness. The large joints are often implicated, but the disease usually attacks the middle-sized ones. Hence the knee, ankle, wrist, and elbow are the chief seats. The disease tends to shift from one joint to another, and does not often remain fixed in the one first affected.

When the disease is thoroughly established the pain is severe, and is intensified by the slightest movement. The pulse is full and quick, and the fever is attended with a peculiar acrid, copious, and sour-smelling sweat. This sweat, which may almost be regarded as pathognomonic of the disease, seems neither to mitigate the fever nor relieve the pain. The bowels are constipated, and the urine is high-coloured, scanty, and deposits a quantity of urates on cooling.

Unfortunately the disease is not limited to the joints. It has been found that in three cases out of four of acute articular rheumatism with high fever, the heart is affected

by endocarditis or endopericarditis, and the foundation is laid for permanent chronic valvular disease. The cardiac complication is insidious, and frequently attended with no pain, and it is only discovered on examination with the stethoscope; it sets in, as a rule, about the seventh day. While pneumonia is rare, pleurisy with effusion may complicate matters.

The temperature ranges from 100° to 104° , gradually ascending for at least a week, and is subject to considerable variations. Sometimes it reaches as high as 108° or 109° , and then death quickly ensues. The amount of urea excreted is very high, reaching, in an average acute case, to 800 grains daily, nearly double the standard of health.

The duration of the attack varies from three to six weeks. Relapses are common, and although five to six weeks is the usual limit, the attack may extend over some months, as it has no fixed epoch for its departure. The termination is generally in recovery, but often a joint or joints may be left stiff, or may become chronically enlarged. The average number of deaths is usually 1 in 1000. Rheumatism is not thus so serious in itself as in the after-mischief which it entails by cardiac and other complications. A variety of subacute rheumatism sometimes met with during an attack of gonorrhoea is termed "gonorrhoeal rheumatism." In this form the disease usually locates itself in one of the large joints, as the knee, which becomes the seat of considerable effusion and swelling.

In **CHRONIC RHEUMATISM** there is subacute inflammation of one or more joints, notably the knee, ankle, and shoulders; and the pain, which is more or less constant at all times, is aggravated by changes of weather, and is accompanied by swelling. The structural changes are those of chronic inflammatory irritation, attended by thickening of the cartilaginous and synovial tissues, which thickening extends subsequently to the capsule of the joint and the neighbouring structures, but shows little tendency to the formation of a liquid exudation,

especially of a purulent kind. Sometimes, in consequence of this thickening, and through coalescence of the membranous elements of the articulation with the soft parts lying over them, the joints may become stiff; the cartilages may be frayed out, and ultimately worn away; abnormal adhesions may form, and permanent ankylosis result. Generally speaking, in chronic rheumatism one or more joints are constantly tender and painful and swollen. Stiffness and grating may be detected after a night's repose, and many patients are warned of approaching changes of weather by abnormal sensations in the affected joints; hence the term "prophetic joints." At the same time, it must be remembered that chronic rheumatism is peculiar to the latter half of life; that there is no attendant fever; that it never shifts quickly from joint to joint—never attacks internal organs; and these characteristics, with its tedious course, sufficiently distinguish it from the acute variety, which, however, may supervene at any time on the chronic form. The prognosis is favourable to life, but unfavourable as regards complete recovery.

A connecting link, somewhat difficult to describe, exists between the general type of chronic rheumatism in its advanced stages and a peculiar variety allied both to gout and rheumatism, and termed osteo-arthritis. *Synonyms*—Arthritis nodosa, arthritis deformans, rheumatoid arthritis, nodular gout. It is essentially a disease of the poorer class, and prolonged exposure to cold and damp is one of the chief causes to which the malady is ascribed. Youth and childhood are exempt from it, and it more commonly exists after the thirtieth year, selecting the joints most continuously and severely overtasked by manual labour. The disease comes on very gradually, the earliest symptom being pain in one or more joints, which pain appears and disappears without any appreciable cause. In the course of weeks or months stiffness is apparent in the joints affected, and the articular ends of the bones become thickened, and grow steadily larger as the disease goes on. With their enlargement the muscles covering the

joints waste, and deformity ensues, this deformity in the smaller joints being symmetrical in character. Thus the fingers in the hands are displaced and arranged in a twisted manner over one another either towards the thumb or little finger, so that the hand frequently be



Fig. 4.

comes like a bird's claw. While the thumbs are usually spared, their homologues, the great toes on the feet, are more frequently and severely attacked than their neighbours. The annexed woodcut fairly represents "arthritis deformans."

The course of the malady, though exceptionally slow, is usually progressive. When once fully developed it is never known to recede, though months and years may elapse before fresh joints are implicated. Roughly speaking, it runs its course without fever or much constitutional disturbance, and treatment exerts little influence on it. All the constituent parts of the articulation—cartilage, bone, and synovial membrane—are implicated in the inflammatory process, although the actual beginning commences in the cartilages, with overgrowth and subsequent ossification, especially at the free borders, leading to easily detected nodular masses of bone.

Treatment.—The varying course and duration of the disease has clouded the actual value of medicinal agents, and hence a shifting therapeutics has characterised the treatment of acute articular rheumatism. Bleeding, mer-

cury, and purgatives had their day, but were long ago practically abandoned, and up to a recent time the alkaline treatment was generally adopted. It is said that the heart is only implicated during the first week of the disease, when the fever is high and the urine acid, and that it is not attacked when the urine is alkaline. Hence two scruples of the bicarbonate of potass should be given every three or four hours in half a bottle of soda-water, or in an effervescing citrate of ammonia draught, and should be continued steadily until the febrile disturbance is much lessened, the pulse reduced, and the urine rendered alkaline. If the patient is robust and the urine loaded with lithates, ten minims of vin. colch. should be added to each draught.

Locally, alkaline lotions should also be applied. Half an ounce of carbonate of soda and six drachms of liq. opii are put into nine ounces of hot water. Flannels are soaked in this, wrung out, and applied to the affected joints, while gutta percha tissue is placed over all. A sort of local vapour bath is thus established.

Lemon juice may be given as a drink, to the extent of two or three ounces daily.

The patient should always lie between blankets. The perspiration is thus absorbed, and there is greater comfort, and less risk of catching cold. Milk and farinaceous food should be the diet at first, followed by beef-tea and stimulants if there be any signs of depression; sherry taken with soda-water being, by preference, the best stimulant.

While the alkaline treatment has still its advocates, and repeated blisters find favour with a few, it is undoubtedly the case that at the present moment the therapeutics of rheumatism has been largely advanced by the administration of salicin or salicylic acid. The result of the remedies seems identical, although the one is obtained from the bark of the willow-tree, and the other artificially from the action of carbon dioxide on phenol, and consists in—1st, diminishing the pain; 2d, lowering the temperature in forty-eight hours, and thus

lessening the severity and duration of the disease. Neither drug should be continued after the ends mentioned have been accomplished, as their further employment is weakening to the system and retards permanent recovery. The identity of the action of the two drugs is accounted for by the fact that salicin is converted into salicylic acid after its entry into the stomach. Pure salicin seems, however, preferable to artificially prepared salicylic acid, and does not appear to cause any disagreeable head symptoms or tendency to syncope. In carrying out the treatment the following points are of practical importance:—

1. In all cases salicin should be given in preference to salicylic acid or salicylate of soda, in 25-grain doses every two hours, dissolved in milk. This remedy, unless cardiac complications exist, will lower the temperature and abate the pain within forty-eight hours.

2. After forty-eight hours the salicin should be administered in the same doses, every four hours for three days, and then every six hours for three days. At the expiry of seven days it may be given in 7-grain doses for three days, thrice daily, and then stopped altogether. A mixture of iron and quinine should afterwards be administered.

3. If, at the expiry of forty-eight hours, there is no diminution of temperature, there is a probability that the heart is affected, though the symptoms observed by auscultation and percussion may be obscure. Salicin does not seem to have any beneficial influence in peri- or endo-carditis, when cardiac inflammation has actually set in, and, as its action is in the main depressing, it should be stopped entirely. Large warm poultices should be applied to the chest. Morphia injected at first subcutaneously over the cardiac region, afterwards given by the mouth, in such strength and frequency as to keep the patient free from pain and afford rest. For other treatment see Pericarditis, p. 221.

4. See that the salicin is properly eliminated from the system. This is readily done by testing the patient's urine with tinctura ferri perchloride, which gives a purple colour, through the action of the iron on the salicin,

transformed in the system into a salt of salicylic or salic acid. On salicin dissolved alone the tincture has no action.

The treatment mentioned has been carried out in upwards of 200 acute cases by me without a single failure, and fortunately without any cardiac complications. In previous editions of this work it was recommended to stop the administration of the salicin altogether two days after the temperature was lowered. Relapses, however, occurred and showed that the salicin treatment should not be interrupted so soon. Hence its continued administration for the time mentioned was put in force with most satisfactory results, and with no relapses.

Should a high temperature set in rapidly, in the ordinary course of the disease, it indicates cerebral complications, and the only hope of averting a fatal issue is by placing the patient in a cold bath, as mentioned under typhoid fever. By this means, and ice applied to the shaven scalp, it is possible to lower the hyperpyrexia.

This line of treatment may be supplemented by placing the affected limb in a light starch bandage after injecting morphia subcutaneously. A one per cent watery solution of carbolic acid has been recommended recently, or painting the joint with the same acid and linseed oil in the proportion of 1 to 15.

The diet in acute rheumatism should be milk, supplemented by nourishing soups, at stated intervals. The bowels should be solicited to act daily by citrate of magnesia or a Seidlitz powder. Convalescence should be aided by fish and white meat, as boiled chicken or roasted mutton, with claret. Eggs should be avoided.

In chronic rheumatism the treatment is essentially tonic, and if possible a residence should be selected in a dry warm climate. Of other means, iodide of potassium seems the best given internally, combined with stimulating liniments of turpentine, or if the pain is severe, with local injections of morphia. *Mistura Guaiaci* has long had a deserved reputation in chronic forms of rheumatism accompanied by great debility, in which the symptoms

are relieved by warmth ; or pulv. guaiaci with iodide of potassium and tinct. colchici (F. 6a). If circumstances admit, and if there should be effusion, concentrated brine springs, rich in solid matter, are useful, as Aix-la-Chapelle, Aix-les-Bains, and Wiesbaden, Woodhall, and Droitwich ; while, if the pain is great, the more indifferent waters containing less saline matter are efficacious, as Wildbad.

GOUT.

Sydenham, the father of English medicine, who was a martyr to gout, thus congratulates himself on the fact :—

“So have lived, and so have died, great kings, and leaders of armies and fleets, philosophers, and men of varied culture, of this peculiar disease. It kills more rich men than poor, more wise than simple.”

Gout was formerly considered to be a catarrh, and derived its name from the French *goutte*, Latin *gutta*, a drop, because it was supposed to be produced by a liquid which was distilled drop by drop into the diseased part. It is now deemed a specific inflammation, attacking by preference those who live well, and especially those who are hereditarily predisposed to it. It is not unknown in London hospitals, as boatmen, butchers, and footmen are admitted with it. In Scotch infirmaries it is never seen.

It rarely attacks women. It is hereditary, and the result of living high, and eating too much, and of sedentary habits. It is specially induced by port wine, strong ale and porter, and rich food ; and is rarely due to drinking gin or whisky.

Its special seat is the great toe, but it has also been observed in the heel, the calf of the leg, the ankle, knee, wrist, thumb, and fingers.

Symptoms.—An attack of gout is said to come on most frequently towards the close of January or beginning of February. For some days the patient feels ill, and out of sorts, with bad digestion, crudities of the stomach, flatulency, and heaviness. The temper is peevish and irritable. With or without these preliminary dyspeptic

symptoms, the patient may go to bed at the usual hour, and awake to find himself suffering from the most severe and excruciating pain in the ball of the big toe, which is said to be similar "to dogs gnawing at a bone from which they have already eaten all that could be got." Even the weight of the bed-clothes is oppressive, and no change of posture gives relief. After some hours the pain may abate, and the patient falls asleep; but on awakening he finds the joint inflamed and swollen. There are also fever and furred tongue, with greater irritability and depression. The urine is high coloured, acid, and deficient in quantity. It is also loaded with urates and uric acid.

The pain continues, with paroxysms of acuteness, for two or three days, in a first and an acute seizure; in other cases, and when the attack is not primary, it may last as many months.

After the paroxysms have subsided the urine is usually copious, with increase of uric acid, which, with phosphoric acid, is at first insufficiently eliminated.

A violent itching of the toe sometimes precedes the outburst of gout; or it may attack the toe when the gout is disappearing, this being followed by decrease of the swelling and desquamation of the cuticle.

Gout does not terminate with one attack, though after a first seizure some years may elapse before a second occurs. The intervals between the attacks become shorter and shorter, and the patient becomes a martyr to gout, which is now not confined to one joint, but invades both hands and feet, external ear, eyelids, and nose. Deposits of a chalky consistence, called "tophi," are formed round the joints, these deposits consisting of urate of soda. Chronic Gout is the term usually applied to this stage. Occasionally there is great distortion of the joints, and sometimes ulceration, with discharge of the concretions.

The same salt also invades the kidneys, being deposited first within the tubules, and subsequently in the inter-tubular tissue, leading to contraction and induration, and constituting what has been termed the "gouty-kidney."

Gout at times attacks internal organs, and then it is best termed Retrocedent Gout. A French author says—"Articular gout is a disease, internal gout is death." It may thus retrocede to the stomach, giving rise to vomiting, internal pain, spasm; or to the heart, leading to disturbed action, small feeble pulse, or coma; or to the brain, causing severe headache, sluggishness, apoplexy, or paralysis; or to the lungs, originating a form of asthma, with severe cough.

Professor Gairdner has alluded to what is termed a "gouty diathesis." By this is meant a habit of body, in which, without gout showing itself externally, flying pains are prevalent over the body, which are sometimes considered neuralgic, and treated accordingly; whereas they are of a gouty nature, and are not benefited by the usual antineuralgic remedies.

Dr. Garrod's researches indicate that, while uric acid can be detected as a mere trace in the blood in health, in gout it exists in a much greater quantity—in fact in detectable excess, as the urate of soda. Recent investigations seem to indicate that, so long as the kidneys are able to carry away this excess, health may be maintained. If, on the other hand, the uriniferous tubules become plugged up by deposits of urates within them, the urates accumulate in the blood, and, becoming deposited in a joint or in joints, they lead to a fit of the gout. Should these renal deposits be washed away, the attack is over, and health is regained. If this does not take place, the kidneys become atrophied, and chronic gout is the result.

Diagnosis.—Gout is allied in some measure to rheumatism in its symptoms and pathology, yet differs materially from it. Gout attacks either one joint or the small joints, and usually occurs after thirty as the result of hereditary taint or high living. It is associated at first with a vivid redness, and afterwards with the formation of chalk stones; while rheumatism invades the larger joints, produces fluctuation there, occurs at any age, and is accompanied by fever and a peculiar sour-smelling sweat. Finally, rheumatism is a disease of the poor,

gout of the rich, or of those who are able to afford the luxuries of the wealthy.

In gout, before and during the fit, the urates are deficient, though they become excessive afterwards ; while in rheumatism the urates are always abundant.

Treatment resolves itself into what to do, and what not to do. Cold applied to the foot has been known to result in death or hemiplegia. Leeches are rarely productive of good, while general blood-letting is now abandoned.

The indications of treatment resolve themselves into a brisk purgative of calomel and colocynth, followed by a black draught. When the bowels have been freely opened, but not till then, administer colchicum, with sedatives and alkalies, or in Vichy water (F. 68). The chief rules to be remembered in giving it are these—

1st, To give it in the form of the tincture in 30-minim doses, and never to exceed 120 minims in the twenty-four hours.

2d, Suspend the medicine immediately if it causes more than four stools in the day. It may avert a paroxysm, but it has no influence on the gouty diathesis, and even with regard to its former property, it seems in time to lose its influence, so that the patient pays dearly for his temporary immunity by a terribly severe outburst of the disease.¹

Locally, enjoin perfect rest. Wrap the affected part in flannel, or cotton wool, or oiled silk, or apply a poultice sprinkled with opium or belladonna, and, when the inflammation has subsided, bandage, and use slight friction. During the height of the fever the diet should be light and sloppy—milk, arrowroot, tea. When the fever abates, give beef-tea or chicken-soup, with plenty of lithia water. For retrocedent gout sinapisms and antispasmodics are necessary.

After the acute attack is over, regulate the digestive organs and bowels, and tell the patient to abstain from

¹ For new treatment of gout recommended by Dr. Mortimer Granville see *Therapeutical Index*, page 491.

port, heavy sherry, fruit, ale, and porter. Claret and hock seem to do good rather than harm. The diet should not contain too much animal food, and plenty of exercise should be enjoined.

The mineral waters of Bath, Cheltenham, Harrogate, and Leamington, in this country, are beneficial. Those of Wiesbaden, Vichy, Carlsbad, Aix-la-Chapelle, Teplitz, Marienbad, Tarasp, and Homburg, on the Continent, can be highly recommended.

CANCER (*cancer*, a crab).

Cancer consists partly of cells of an epithelial origin and partly of connective tissue. The connective tissue forms alveolar spaces, which vary in structure from a loose fibro-cellular material to strong and old fibrous tissue. The alveolar spaces are never separated from one another by stroma of any kind, but, on the contrary, communicate with each other and contain epithelial cells. These cells vary in size and shape and arrangement, but they are always separable from the connective tissue.

Cancers never originate except in connection with epithelial or epidermic structures in the skin, mucous membranes, and secreting glands.

Cancers do not remain fixed to their original sites, but tend to spread through lymphatic glands, which collect their supply of lymph from the original tumour. They increase in size by invading surrounding tissues. They are enveloped by no capsule, and they tend to implicate the skin and cause ulceration.

Cancers vary in type and malignancy, and they are subdivided into—

- | | |
|--------------------------------|----------------------------------|
| 1. Hard cancer or scirrhus. | } Glandular type. |
| 2. Soft cancer or encephaloid. | |
| 3. Lobular epithelioma. | } Epithelial and epidermic type. |
| 4. Cylindrical epithelioma. | |
| 5. Colloid. | |

SCIRRHUS, the first variety, is hard—harder even than

any other tumour occurring in the body, except bony, and this hardness depends upon the large proportions which the alveolar stroma bears to the contained cells. It is most common in the female breast, but it also occurs in the stomach, uterus, tongue, œsophagus, and other glands. There is heard a creaking sound when scirrhus cancer is cut with a knife, and the cut surfaces are at once hollowed in the centre. These hollowed centres are very hard, and of a glistening white colour. There is no sharp defining edge to the growth, and between the centre and the edge the greater part of the tumour is of a pinkish yellow colour—pink and soft externally, yellow and hard internally. The surface yields a milky juice.

ENCEPHALOID, or soft cancer, is so termed from its brain-like appearance. It is softer than scirrhus, grows more rapidly, and attacks more internal organs. It affects chiefly as a primary growth the salivary and mammary glands, testicles, ovaries, thyroid body, and the mucous membrane of the nose, liver, and stomach. It is more common in youth than age. The cells are larger than those seen in scirrhus. They are contained in greater spaces, and the stroma is relatively more delicate and small. It is by far the most malignant form of cancer, and increases with alarming rapidity, and generates the general cachexia of cancer in a short time.

LOBULAR EPITHELIOMA.—Lobular epithelioma, epithelial cancer, or cancrioid, develops in connection with the skin and mucous membrane, and its sites are near the natural orifices of the mucous tracts, *e.g.* mouth, tongue, anus, penis, or vulva, sometimes in the scrotum (chimney-sweep's cancer), and the upper end of the œsophagus. It originates like a pimple, which breaks down and forms a sore. Fully developed, it is seen as a ragged, irregular-edged ulcer, having an extensive, hard, and nodular base. Pain is a prominent feature, and the lymphatic glands near it are enlarged.

Epithelioma seems to have a local origin, and if detected and excised it may not recur for a length of time. If it

does recur its appearance will be detected by the lymphatic glands in the same region enlarging, and the scar of the cicatrix becoming inflamed.

CYLINDRICAL EPITHELIOMA.—Cylindrical epithelioma is especially the cancer of the alimentary mucous membrane, but it may also occur in the bladder or elsewhere. It forms a prominent tumour in the interior of a viscus, and may reach an enormous size.

A section to the naked eye appears generally whitish and granular, this appearance being due to the tubules of which it is made; for a microscopical examination reveals irregular tubules, with columnar epithelium in one or more layers.

COLLOID.—Colloid or alveolar cancer is jelly-like in appearance, and it is doubtful whether it originates as a distinct type of cancer, or whether it results from the degeneration of one of the types of cancer previously described. It is found most frequently in the abdominal viscera and peritoneum. Its malignancy is great, and it spreads rapidly to adjacent tissues, and causes death most frequently by interference with the functions of the organs attacked.

To the naked eye, colloid cancer looks like a mass of semi-transparent jelly, through which delicate white bands are observed. These bands under the microscope are seen to be actually fibrous. The contained jelly is arranged in concentric laminae, between which are minute granules, and in the centre of them is a granular mass, probably the remains of altered cells.*

TUBERCULOSIS—TUBERCLE.

By tuberculosis is meant the production of tubercle, and as it affects during life one organ more than others it is generally distinguished by the name of the organ most diseased. Hence we speak of "tubercular peritonitis," "tubercular meningitis," "tubercular laryngitis,"

“tubercular phthisis,” “tubercle of kidneys,” testicles, hair, and skin.

There is only one exception to this general statement, and it is in the designation given to tubercle when it is not local but general, and invades the whole system like typhus and typhoid fever; then it is termed Acute Tuberculosis.

Again, tuberculosis may be acute or chronic, the latter variety being most common, yet the acute type is seen in “tubercular meningitis,” “tubercular peritonitis,” “acute pulmonary tuberculosis” (galloping consumption), and the typhoid form of the disease.

The widespread nature of diseases dependent on tubercle is evidenced by the statement that in some towns 25 per cent of the death-rate is due to tubercular disease, and that all over the world it is the cause of the direct mortality of one-seventh of the classified forms of disease.

What then is tubercle?

The primitive tubercle is a microscopic body, and in it there are corpuscles embedded in a RETICULUM. The corpuscles are round, most of them are like lymphatic corpuscles, smaller than blood leucocytes; some, however, are larger. The corpuscle is colourless, translucent, slightly granular, easily broken up, and in the fully-developed cell there is a single nucleus, small, homogeneous, often shining. The larger cells contain more than one nucleus—sometimes the number may be twelve. The “reticulum” consists of a fine network of connective tissue fibres. According as the “fibrous” or the “cellular element” of the tubercle predominates it may be called “cellular” or “fibrous tubercle”—the former being more common.

In the “fibrous tubercle” there is often found a large giant cell, with peripheral nuclei embedded in granular protoplasm and arranged in radiate fashion, but there are no epithelial cells; probably this is accounted for by the fact of an arrest in the growth of the tubercle at an earlier stage. In “cellular tubercle” where a giant cell

exists the epithelioid cells are placed around it. In fibrous tubercle a giant cell is always present at the very centre.

Late investigations of Friedländer show that there are no distinguishing characters in the giant cell of tubercle, and he asserts that even the reticulum of tubercle is due to the hardening process employed in the preparation of the microscopical specimens, for in its original fresh state there is nothing but amorphous intercellular matter.

Whence originates this great cell?

The answer to this question varies. Some, as Schüppel, say it arises within a blood-vessel (capillaries or small veins), and that at this spot the vessel becomes choked and distended. Round this there exists a protoplasm in which ultimately nuclei appear, and so soon as the giant cell becomes surrounded by other cells the wall of the blood-vessel disappears.

Others deny this ingenious and apparently truthful origin of the giant cell, and suppose that it is formed from endothelium; some state that it comes from blood leucocytes; some from free protoplasm.

So the question of the origin of the giant cell, though a gigantic fact, remains practically at the present undecided.

How does tubercle grow?

It enlarges by the formation of fresh tubercular foci round the original focus; so that when six or more of these tubercular foci are welded together into one body, this assumes a visible shape and becomes a small nodule (tuberculum). If this welding does not take place, the nodular form is not observed, but there is a confused mass of different and irregular shapes to which the term "infiltration" is given. Yet the difference between these two states is merely a naked eye difference; for whether the confluent tubercle retains the nodular shape or not, the primitive tubercle is always a "tuberculum."

The nodular tubercle corresponds to Bayles's granulations and Laennec's miliary tubercle. The term "miliary" has become engrafted on all tubercular literature,

but it is to be remembered it has lost its original meaning.

FOR MILIARY TUBERCLE MAY OR MAY NOT BE OF THE SIZE OF A MILLET SEED ; AND TUBERCLE THE SIZE OF A MILLET SEED MAY OR MAY NOT BE MILIARY.

All that is now meant by miliary tubercle is a small nodule, roundish, seldom larger than a hemp seed, colourless or grayish ; consistence almost equal to that of cartilage, and either quite transparent or opalescent.

There are nodular neoplasms other than tubercular seen in disseminated carcinoma and sarcoma, lympho-sarcoma, lukaemic nodules, and small fibromata. The diagnosis of the miliary tubercle from these nodules rests upon the discovery of more definite lesions in the same body and upon the microscopical structure.

"Infiltrated tubercle" present in the lungs corresponds to Laennec's gelatiniform and gray infiltration. In the liver the tubercular infiltration runs along the capsule of Glisson between the lobuli. In the cortex of the kidney it appears as streaks between the bundles of tubuli, or as ill-defined, rounded patches. Tubercle not nodular may be seen alongside the small arteries in the cerebral meninges.

Is tubercle vascular ?

However formed it is NOT ; the only approach to vascularity is when tubercle surrounds arteries or veins without closing them.

What metamorphoses occur in tubercle ?

The tubercles described undergo changes, sometimes quickly, within two or three weeks, at other times slowly, even two or three years elapsing without change.

There are, however, two kinds of metamorphoses—the FIBROUS and the CASEOUS—the latter term corresponding to Virchow's "cellular." The FIBROUS metamorphosis is not common ; when it does occur it consists in the reticulum becoming greatly hypertrophied, and constituting a dense intercellular substance, interspersed with a few small spindle-shaped nuclei.

The cells of the tubercle itself undergo the CASEOUS

change, the result being a small fibroma with a cheesy centre (which may afterwards calcify); or a simple fibroma, the cheesy matter being wholly absorbed.

The fibrous condition, when once attained, is permanent and final.

The CASEOUS change is more common, and consists essentially in all parts of the tubercle, first the cells and next the reticulum, becoming infiltrated with oily particles.

It is, in fact, a breaking down, and this breaking down commences in the centre of the original tubercle (the crude yellow tubercle of Laennec).

The oily change is incomplete, and partial drying-up may ensue, technically termed "desiccation." This partial DRYING-UP or DESICCATION constitutes the leading difference between cheesy degeneration and simple fatty degeneration.

But, unlike the fibrous change, the cheesy change is not permanent, for FIVE further changes may occur.

Of what nature?

1. Softening; formation of an abscess, bursting of an abscess, leading to an ulcer, which may heal or more commonly steadily enlarges by the formation and destruction of tubercle. This is phthisis in the literal interpretation of the word—a pining away, a breaking down, a decline.

2. Capsulation: a zone of irritation, then fibrous tissue may enclose the cheesy matter, whether softened or not. This is the encysted tubercle of Bayle.

3. Calcification: the oily particles are gradually replaced by carbonate and phosphate of lime. The change is generally permanent, but at times ulceration may occur round the petrified body, and it may be expectorated.

4. Virchow believes that absorption may take place, and that cheesy glands may in this way entirely disappear. If the present ideas of infection be correct this is the event least to be desired, of all the terminations mentioned.

5. Sloughing may occur. Should the softened material be in communication with a bronchial tube it may be coughed up, and the capsule of the fibrous tissue may

remain empty or with merely fluid contents—a CAVITY, in short, in the midst of the lung tissue. The sides of this cavity may cohere, and nothing may remain of it but a fibrous NODULE or SCAR. To establish the cure it is necessary that the patient should become so healthy as to prevent the deposition of further tubercle, or of what may become tubercle.

It may be here noted that tubercle contains a peculiar virus which can be inoculated and reproduced in the body. This is termed the artificial production of tubercle—initiated by Villemin; followed up by Sir Andrew Clark and Waldenburg; elaborated by Burdon Sanderson and Wilson Fox, whose opinions may be thus briefly expressed. On the inoculated product an inflammation follows which may be designated “simple” or “normal” inflammation. An inflammation which spreads beyond its original limits, and sets up similar inflammations on other parts of the body, may be justly termed “infecting.” A material must have been taken up, either by the absorbents or the veins, from the original focus, into the circulation. When, in the lower animals, local inflammations are produced either in the skin or peritoneum, by the introduction of irritant substances, two distinct sequelæ ensue:—

(1) A chronic disease, exhibiting, in all respects, the anatomical characters of tuberculosis, and consisting essentially in the overgrowth of certain tissues called “lymphatic,” or “adenoid,” and in close relation with the lymphatic system; and (2) pyæmia, an acute disease in which abscesses form.

The difference in these two forms is one not of origin, or even of structure, but of duration and development. These opinions are also held by Chauveau and Rindfleisch. And now comes the further and most important inquiry—

What is the character of the virus which sets up a dyscrasia, which is due to a local lesion, and constitutes in the case in point “a tubercular dyscrasia”?¹ Villemin supposed it to be liquid; Sanderson and Waldenburg

¹ Dyscrasia means a mis-composition or a qualitative lesion, and the term is now applied only to qualitative lesions of the blood.

considered it took the form of minute solid particles ; Schüller and Toussaint declared it to be a micrococcus ; and Koch asserts that it is a specific tubercular organism seen only in tubercular structures, and in the sputa of phthisis. Koch's bacillus is a slender, rod-shaped, motionless body, which equals in length one quarter to the whole of the breadth of a red blood corpuscle. "SUCH IS ITS SHAPE AND APPEARANCE, AND IT DIFFERS FROM ALL KNOWN BACILLI IN REMAINING UNAFFECTED BY THE STAINING AGENT VESUVIN."

Koch's own words are :—"In all the morbid processes which, on account of their course, as well as of the characteristic microscopical structure, and the infectious properties of their products, must be considered true tuberculosis, there always occur in the tuberculous centres rod-like formations (tubercle bacilli) which can be demonstrated with the aid of particular methods of colouring ; this holds true both with the tuberculosis of man and of different species of animals."

Moreover he maintains that this bacillus, cultivated in neutral matter through many generations, yet retains the power of setting up tuberculosis when it is inoculated. He describes it further as being a vegetable spore-containing fungus, only capable of growth and multiplication under certain conditions. What are these conditions ? The conditions are that there must be blood serum or animal broth ; that there must be a constant temperature of 30° C. ; and most important (so far as theoretical inferences go), he states that it is unable to continue its development in decomposing fluids, and in the presence of the more active bacilli produced by mere putrefaction. All the conditions for the development and nurture of this bacillus are found in the human body, and it is stated that when inoculated from pure culture or tuberculous matter, it produces tuberculosis ; further, that the same result will happen if it is intimately diffused in water and dispersed through the atmosphere in the form of spray. Animals breathing this spray will die of tuberculosis.

The inference is therefore clear, from these statements

of Koch, that contagion is the only means by which tuberculosis can be produced, and that, in his own words, a disease is "not phthisis until it is tuberculosis." The dogmatic sweeping assertions and inferences of Koch for a time staggered our best pathologists and physicians. They ran dead against the long accepted and mournful doctrine that phthisis was hereditary ; that it depended on climatic, social, and industrial causes ; and it was inferred, from its living organism being the prime mover in this disease, that specific inhalations would cut short its existence, and that consumption in the fair future would cease to appear in the mortality tables. As time, however, has gone on, the doctrines of Koch have been questioned. The rarity of the contagion is shown by the experience of married people, and, above all, by the facts that attendants or nurses at consumption hospitals, breathing daily a bacillus-laden atmosphere, are scarcely ever attacked by the disease, and that the mortality from all sources in these places is rather below than above the average. It is beyond the nature of this manual to proceed further with this discussion. I have placed Koch's case fully and fairly before the reader, and have only to state that all my experience in hospital and private practice fortifies the supposition of hereditary phthisis, and discountenances the idea of its contagious nature. I have repeatedly seen devoted wives, nursing phthisical husbands, under circumstances, which, from their very nature, would intensify the bacillus poison, but have never yet seen the unselfish love prominent in many a sick-room rewarded by the germs of the fatal malady. When I say that, in my belief, phthisis is a constitutional disease, I mean that with birth from a phthisical father or mother, a person, in the great majority of cases, inherits a something, which will be evoked to tubercular life and decay either in his growing youth or mature manhood. Further, I hold that the earliest sign of this may be, nay, most frequently is, marked with acute catarrhal symptoms, due to exposure, to cold, or dust, or hæmorrhage ; that, unless this is checked, tubercle will form at the seat of congestion—in nine cases out of ten the

apex of one lung—and with the tubercular decay the specific bacillus will form and nestle and multiply. Its recognition under the microscopical slide stamps clearly the diagnosis of phthisis, and, as the discoverer of this, great and growing fame will attach to the careful researches of the German discoverer. By his investigations he has given a character to the sputa of phthisis, and placed the disease as a distinct and peculiar malady of the pulmonary tract. Further than this, at the present, we cannot go. Therefore, I shall, when speaking of phthisis, still adopt the divisions familiar to English readers previous to Koch's discovery.

Moreover I feel constrained to retain as verified facts the following statements about tuberculosis, although they do not appear consistent with Koch's theory of a specific and infective origin of all cases of tubercular disease.

It is impossible to deny that tuberculosis is hereditary, and that it may also originate from breathing a vitiated air, or from want of proper nourishment or exercise. Any disease which tends to weaken the body and impair digestion favours the development of tubercle; and it may be further added that, whenever an organ is specially weakened by previous disease, there tubercle may form. It may also be stated that general tuberculosis has been set up in animals by the inoculation of caseous material.

What general symptoms indicate tubercle?

A delicate white skin, which at times blushes with a rosy hue of characteristic beauty; a coldness of the body; in youth great precocity both in walking and talking; a somewhat swollen abdomen; and a strong disinclination for all fatty food.

When the tubercles are forming, or have actually formed, there is marked debility, loss of flesh, and a fever of a remittent character, as is indicated by a rise of the thermometer in the evening and a fall in the morning.

Hippocrates defined *Struma Vera* (χοιράδες) to be glandular scrofula, and this correct definition leads to the knowledge of a special type of disease, which is more

than glandular, and may be grouped under the wide signification of "Strumous or Scrofulous Diathesis."

"Struma Vera" in its earliest stage reveals the gland studded with tubercles. These tubercles degenerate into a cheesy mass, or otherwise, and the subsequent changes which the gland undergoes are due to changes in the tubercles.

Struma Vera implies an inflammable state of the system—a certain vulnerability peculiar to those who inherit the scrofulous constitution. A blow or injury inflicted on a healthy person may lead to inflammation, followed by suppuration and subsequent healing,—a blow to a scrofulous person means far more than this. It leads to local inflammation at the seat of the injury; possibly this will spread and attack glands, the inflammation in which is characterised by slow induration, no suppuration, but the inflammatory products undergo the cheesy change. A scrofulous exudation differs histologically from an ordinary inflammatory exudation in a healthy person in being rich in cells larger than those of a genuine exudation. These cells exist on a dim glistening protoplasm, and have a large nucleus—single or double. They are epithelial cells. Further, the exudation is diffused, and the infiltration assumes no particular shape, or it becomes tubercular.

Thus the scrofulous constitution changes the type of various diseases, and for the worse. They become more intractable to treatment. Scrofulous eczema and impetigo may linger for a very prolonged period. On mucous membranes scrofulous inflammation imprints peculiar characters, as seen in ophthalmia, cough, bronchitis, laryngitis, cystitis, and pyelitis. Joints also may be involved, and scrofulous arthritis, osteitis, and periostitis result. Lungs, kidney, and testicle may be the seat of primitive strumous disease.

We understand, therefore, that the scrofulous diathesis cannot be considered to be distinct from the tuberculous. It is simply a coarser expression of the same picture. The lymphatic glands of the neck are enlarged, sometimes

even they suppurate ; the face is not so intelligent, nor has it the same transparency or regularity of feature ; the lips are frequently thick and swollen ; the nose flattened ; forehead low ; the teeth carious ; and the belly much enlarged during early life.

Paget says : "The scrofulous constitution is peculiarly liable to tuberculous disease."

TUBERCULAR DISEASE MAY BE MISTAKEN IN EARLY LIFE FOR TYPHOID FEVER. THE INDICATIONS BY THE THERMOMETER ARE SIMILAR ; BUT THERE IS AN ABSENCE OF GURGLING IN THE ILIAC REGION, OF ROSE-COLOURED SPOTS, OR OF CHARACTERISTIC PEA-SOUP STOOLS ; AND WHILE NIGHT SWEATS ARE ASSOCIATED WITH TUBERCULOSIS, THEY ARE UNKNOWN IN TYPHOID FEVER.

Tubercular disease is often preceded by what is called strumous dyspepsia. By that term is not meant ordinary dyspepsia, pain or vomiting after taking food, but a kind of shuddering distaste for all fatty food, and which, if taken, gives rise to nasty acid eructations, quite distinct from ordinary faulty digestion. Statistics show that this dyspepsia was present in 77 per cent ; and out of 50 cases carefully tabulated by Mr. Hutchinson, it was found that it had preceded the chest symptoms in 33.

Prophylactic measures are necessary to prevent the transmission of tubercular disease ; 1st, Marriage should be well assorted, and should not be contracted by those labouring under this diathesis. 2d, If a child is born when there is evidence of this complaint on the part of one or other of the parents, it should be entrusted to a healthy wet nurse, and should be much in the open air both during and after lactation. Cleanliness and friction of the skin should be attended to ; and substances which are likely to occasion diarrhoea, such as fruits and pastry, should be avoided.

If circumstances permit, such children should be sent to a warm and equable climate until the constitution is well developed. They will there be enabled to spend much time out of doors without risk of catching cold, and

thus obtain the most important hygienic factors—daily exercise and a pure atmosphere.

On the same principle sea voyages are useful. There is not much risk of catching cold at sea, and the appetite and the digestion are improved.

The appropriate treatment for each of the tubercular complaints—phthisis, tabes mesenterica, etc.—will be alluded to, under the separate diseases. The general principles, however, are good nourishment, fresh air, warm clothing, and great attention paid to the digestive system. By these means, aided by appropriate medicines, it is our hope to remedy the blood disease connected with tuberculosis (F. 81).

RICKETS.

Rickets is a disorder of nutrition peculiar to childhood. This disordered nutrition leads to overgrowth, with deficient calcification of the tissues destined to form bone, and hence the growth of the skeleton is interfered with, and transient or permanent deformity occasioned of some of its constituent parts.

The etiology of rickets has excited much controversy, and evoked many theories. It is acknowledged to be a disease of the poor more than the rich, and especially the poor of large towns. The period for its first appearance in the majority of cases, as shown by statistics, is during the first dentition from the sixth to the thirtieth month. It seems to affect the sexes in equal proportions, and in some cases is inherited, especially from the mother. Improper feeding, authorities unanimously state, takes the foremost place as an exciting cause, and some have supposed that keeping the child too long at the breast has been the chief factor in its production, while others affirmed it to be too early weaning. Probably both views are to a certain extent correct, for too long suckling gives insufficient nourishment, while too early weaning and the substitution of unsuitable food will prove prejudicial to the child's development and growth.

Wagner's views as to the production of rickets appear sensible and practical, and present a chemico-philosophical explanation of the problem. There is, he states, an irritation of the bone-forming tissue, and it is found that phosphorus aids the irritation if lime is withdrawn from the food, for rickets can be produced in this way experimentally. Lactic acid has a similar effect to phosphorus as an irritant to the bone-forming tissue, and lactic acid in excess is found in the system of rickety children. The irritant accordingly exists in the lactic acid, and the other condition to the production of rickets, deficiency of lime, is afforded whenever the mother's milk, by prolonged suckling or weakness, becomes poor in earthy salts, or whenever the digestive derangements of the child cause these salts to be excreted more abundantly than usual, as, for example, by diarrhoea. Thus, then, by improper feeding too much lactic acid is produced, and consequently bone-forming irritation is occasioned. At the same time, the earthy matter is reduced either directly, as in cases of prolonged suckling, or indirectly, as when diarrhoea carries off the lime salts from the intestines before they are absorbed. The combination of these two factors causes rickets, and its origin, so far as symptoms are concerned, is insidious. The child is fretful, and the bowels are irregular. It cries when its limbs are firmly grasped. There may be restlessness or fever at night and morning. With this restlessness and sensitiveness of all parts of the body to even gentle pressure, there is another characteristic, namely, profuse perspirations over the head and neck and chest of the child during sleep.

These symptoms may have been noted some time before the peculiar changes in the bones commence. The articular ends of the long bones swell and protrude under the soft parts, more particularly on the hands, feet, elbows, and knees. In the skull, the disease shows itself by non-closing of the fontanelles and sutures. If the child is young, the teeth do not come forward—if older, they may rot and drop out. Through the force applied

to the bones by the muscles attached to them, and by the weight of the body, they become further deformed and bent, usually in an outward curve. The ribs also are depressed laterally, and cause the breast-bone to stick out like the keel of a boat. There is also often spinal curvature. Naturally, the increase of the body is delayed. The child cannot walk; or if it could walk before, it loses the power to do so. In mild cases the disease does not advance far. The morbid process is checked, and results in recovery, with, however, more or less striking deformity. In severe cases the diarrhoea increases, the weakness is extreme, and the child dies with the symptoms of marasmus and hectic fever. The younger the child, the greater the danger. The deformities of the skeleton may entirely disappear, and of those that remain two only may be troublesome in after-life—the chicken breast in both sexes, and the distorted pelvis in the female.

Treatment.—Hygienic rules must be carefully enforced. The earliest possible symptom of rickets should be watched, and if detected, the extension of the disease may be prevented. The mother's milk must be carefully attended to. As a rule, this is sufficient until the sixth or seventh month without any auxiliary aid, but after that time it should be supplemented, and how? By the use of cow's milk, sweetened and diluted according to the age of the child. Next to cow's milk are Nestle's food and Revalenta Arabica, the main constituent of which is finely powdered lentil meal. The child should not be suckled after it is ten months old. At nights it should have a tepid bath in which there is some of Tidman's sea salt. Sea air in summer is very essential, and effects in many cases marked improvement. During the day it should be carefully protected from cold and much in the open air. Lime water should be given several times a day—a teaspoonful either in the milk or by itself. If the digestion is fairly good, some light preparation of iron may also be used, and cod-liver oil is essential in winter—the doses increasing from a teaspoonful to a tablespoonful twice daily. Syr. ferri phosph. should be added to

the cod-liver oil, and if there should be a tendency to diarrhoea, both remedies should be replaced by hypophosphite of lime (F. 82, or F. 82a).

The deformities of the limbs, it may be remembered, tend to disappear as the child grows older; but if not removed, the necessary remedies belong to the domain of surgery.

CRETINISM (*Creta*, chalk).

A connection has been established between cretinism and myxoedema, and doubtless the diseases depend on the same cause—viz. an affection of the thyroid gland. But until the connection is more fully brought out it is necessary as yet to consider cretinism as a distinct malady. Cretinism may be defined to be a condition of idiocy dependent upon endemic causes, and associated with incapacity of mind and deformity of body. It is observed in all countries, and generally in valleys connected with large mountain chains. In Europe it is seen in Switzerland, Savoy, and Piedmont, and also in the Pyrenees. In England it has been noted in the dales of Lancashire and Yorkshire. The typical cretin has a remarkable physique. He is rarely more than 5 feet in height. His skin is yellowish tawny, thickened or wrinkled, and looking too large for the body; the expression of the face stupid, the tongue large and thick, and often hanging from the mouth, which is partly open, margined by thick lips, and with saliva generally dribbling from it. The abdomen is pendulous from the looseness of the skin, and the legs are usually short and deformed. The ossification of the fontanelles and sutures of the head is delayed, so that the cranium is hydrocephalic. The intellectual faculties are imperfectly developed. The cretin is often unable to speak, and rarely can hear. The affection is more or less associated with enlargement of the thyroid gland. Few live beyond thirty years, and they are generally impotent.

The conditions for the development of this peculiar creature are hereditary predisposition, aided by atmospheric, and possibly geological conditions, peculiar to

special localities. The cretin develops in the valleys, where there are few atmospheric changes, and where the existence of magnesian limestone is prevalent in the soil and in the water which is drunk. Goitre frequently accompanies cretinism, and seems dependent on the same factors. The term "sporadic cretinism" is applied to certain children, whose development is arrested at the first dentition, and who, it is stated, are generally the offspring of those addicted to alcoholism. In these cases there is an absence of the thyroid body.

Treatment is prophylactic. The child should be removed from the surrounding associations, which seem to develop cretinism, and taken to a soil which is dry and porous.

Diet should be nutritious. Cod-liver oil should be given liberally with syrup of the phosphates.

Cleanliness is essential, and physical exercise of the muscles ought to be encouraged.

MYXŒDEMA (*μύξα*, mucus, *οἰδημα*, a swelling).

This peculiar affection, to which attention was first directed by Dr. Ord of London, is partly, so far as outward appearances go, explained by the derivation of the word. The disease seems to be progressive, and the tissues of the body are invaded by a jelly-like mucus yielding dropsy, but it is unaccompanied by any albuminuria or sign of primary affection of the kidneys.

The subjects of myxœdema are generally adult females (men are, however, affected also by the disease), and they present pathognomonic symptoms of the disease, especially on the face. This is swollen in every feature, the swelling being waxy looking and anæmic; and, as proving its non-renal origin, it affects equally dependent and non-dependent features. The swelling is resilient, not pitting on pressure, and there is a defined scarlet flush of cheek and nose, contrasting markedly with the waxy pallor round the eyes and mouth. The loose, baggy, almost translucent lids, the dry brawny cheeks, and thick blue

lips, with the swollen red expressionless hands (spade-like, Sir William Gull), and deliberate speech and volition, make a group of symptoms peculiar to this disease, as observed in facial expression, hands, and speech.

The conditions noticed in the face are seen to invade, on more minute examination, all parts of the body. For the skin is everywhere thickened, translucent, transparent, dry, and rough to the touch, and perspiration is absent.

Marked as are the external features of the disease, they seem to be outstripped by the peculiar symptoms attached to the nervous system. At first there is a desire to be let alone so far as voluntary movements and speaking are concerned; in later stages of the disease aberration of the mind supervenes. The speech is slow and laboured, the movements of the limbs are languid, the maintenance of fixed attitudes requires much attention, and falls are not unfrequent. Sensation is slow, but finally sure. It seems as if the muscular system is all unbraced and toneless, and it requires mental effort to spurt it up even to the torpid activity which sometimes can be developed.

Thought and volition are slow. Ideas come gradually, and are tardily expressed. Yet the language is correct, and the handwriting unchanged. This unwieldy state of body and mind ultimately results in loss of memory. A persistent bitter taste may be felt in the mouth. The teeth generally decay, and the gums are extremely vascular and hypertrophied, so that in some cases the mouth is filled with blood in the morning.

The temperature is persistently subnormal, ranging between 98° and 94° F.

The *prognosis* in the disease is unfavourable. The debility increases, the duration of observed cases being from six years upwards. Death is ushered in either by coma or uræmia or inanition.

The *pathology* of myxœdema may be said to be in its infancy, as cases are rare, but medical opinion seems at present to lean to there being an intimate connection between the disease and the thyroid gland. In cases recorded of the disease in an advanced stage there is

atrophy of this gland, and it would appear, that when the gland has been removed by surgical operation for goitre, progressive symptoms set in, which ultimately terminate in a mixture of myxœdema and cretinism. If this extirpation is done in early life, there seems afterwards to be an arrested development of mind and body, so that a previously bright and lively child becomes a dwarfy cretin, with all the symptoms of myxœdema superadded. The conclusion of a consideration of the cases operated on by Professor Kocher of Berne for goitre, read now by the myxœdemic literature of this country, shows that "the loss of function of the thyroid gland would appear to produce both cretinism and myxœdema."

Treatment.—Cases of myxœdema suggest good food, warm clothing, and the use of iron and arsenic as the basis of treatment. In addition to these it has been found that vapour baths and jaborandi, in the form of extract or by the subcutaneous injection of pilocarpinae nitras, may arrest the signs of myxœdema. Ten to forty minims of the extractum jaborandi may be given four times daily. Nitro-glycerine has benefited one case.

LEPROSY.

Leprosy is derived from *λεπρος*, rough, and as roughness characterised many diseases of the skin, leprosy became a general name for "skin diseases." Hence probably the indefiniteness of the term used in Scripture, where leprosy at one time represented a slight, at another a serious, disorder.

In more modern times the appellation was restricted to elephantiasis—the terms leprosy and elephantiasis being synonymous.

Leprosy and lepra are distinct diseases—the former representing true leprosy; the latter, as *λεπραι*, simply designating scaly white spots on the skin. *Lepra arabum*, elephantiasis græcorum, and leprosy are synonymous terms.

Leprosy is a disease most often seen in warm climates,

but cold countries like Norway and Sweden are not exempt from it. For thirteen centuries it was common in this country, but at the present moment an indigenous case of leprosy is not known.

The cause of leprosy appears to be endemic, and Sir Erasmus Wilson strongly asserts it depends on miasma, and that this supposition accounts for its occurrence in cold as well as warm countries. Food may predispose to it, but no one now believes that leprosy depends on a fish diet. The disease is at the present time recognised as hereditary, non-contagious, and dependent probably on a specific bacillus.

The morbid anatomy of leprosy centres chiefly in the integument and nervous system. Indeed, Virchow believes that the pathological element of leprosy differs in no way from gummata of syphilis, nor, indeed, from that of lupus and glanders. Granulation tissue is characteristic of the three diseases mentioned, but the granulation of elephantiasis is more permanent, and tends in a less degree to degeneration and softening. There is little morbid change in leprosy. The immediate cause of death is generally lardaceous disease of the kidneys, or of other internal organs, as liver and spleen.

Symptoms.—The symptoms of leprosy are insidious and at first attract little attention. A sense of weariness pervades the system, with lack of tone and appetite. These symptoms may come and go for some time before definite and characteristic signs of true leprosy appear, viz. hyperæmia of the skin and a defective sensibility of the peripheral branches of the spinal nerves. The hyperæmia consists of red, circular blotches on the face, neck, hands, and feet, while isolated spots of redness appear on the trunk of the body and fleshy parts of the limbs.

The tint of the colour is red and coppery; as it subsides it leaves a pigmentary stain; the affected skin is puffy with serous infiltration, and the pores are dilated. The general appearance resembles the rind of an orange.

In advanced stages the centre of the blotch becomes

white, and is surrounded by a thin red belt. Hence, probably, the expression, a "leper white as snow."

The parts chiefly affected are the nose, ears, and arms, especially following the distribution of the ulnar nerves. In some instances the bleached parts are covered with a greasy exudation; in others, they are dry, rough, and parched.

In the affected parts of the skin there exists a degree of numbness or *anæsthesia*.

The varieties of leprosy are *elephantiasis tuberosa*, *elephantiasis anæsthetica*,—a sub-group of the latter form, remarkable for dislocation and amputation of the joints, is termed "*Elephantiasis Mutilans*."

Treatment.—The great object is to remove the patient from the surroundings where the disease commenced, and to attempt to improve the general health by a liberal diet. Specific alterative medicines, as arsenic, iodine, and mercury, have been tried without success. Recently Dr. Joseph Dougall has recommended *gurjun* balsam or wood oil as a successful remedy. It is an oleo-resin and is given with lime water, in the form of an emulsion—the dose of the two remedies being from two to four drachms thrice a day.

The local treatment consists in stimulation of the skin by hot air baths, followed by friction and inunction with bland and stimulating oils as *mudar* and *gurjun* oil. Sometimes the tubercles are treated by caustics, as acid nitrate of mercury or *potassa fusa*. Asthenic ulcers are bathed with a solution of chloride of zinc.

FRAMBOESIA (*framboise*, a raspberry).

Synonym—Yaws.

Framboesia consists of an eruption of yellowish or reddish yellow tubercles, which gradually develop into a moist exuding fungus without constitutional symptoms, or with such only as may result from ulceration and prolonged discharge, viz. debility and prostration (Sir Erasmus Wilson).

This peculiar disease attacks the African race in their own country and in the West Indies. It seems to be epidemic and contagious. The incubation ranges from three to ten weeks, and the disease occurs as a rule only once in a lifetime.

The eruption selects by preference as the seat of its development the face and neck, feet and genital organs.

The ordinary duration of the disease is from two to four months with recovery, but it may extend to several years, and lead to death by exhaustion.

Treatment.—Cleanliness, generous diet, the local use of carbolic acid, and diluted nitrate of mercury ointment form the essentials of treatment; sarsaparilla, iodide of potassium, and bitter tonics may be given internally.

PURPURA

seems to be dependent on a lowered vitality, the result of liver disease, affection of the spleen, syphilis, poverty, intemperance, or over-work. This lowered vitality in some way affects the blood, breaking up the red corpuscles, and allowing their contents to transude into the tissues.

The blood thus passed through the capillaries is seen as circular spots, varying from the size of a pin's head to that of a pea, being apparent first on the legs, afterwards on the trunk. They are unaltered by pressure, and have no tendency to coalesce, unless exposed to pressure, when they seem to run into one another, causing vibices or ecchymoses. In their first or circular form they are termed "PETECHIÆ."

Purpura is usually ushered in with slight fever, and with the other usual concomitants of this, viz. thirst, headache, and quick yet compressible pulse. In other instances the premonitory symptoms may pass unnoticed. Not merely does the skin suffer as described, but blood may also be effused into the several mucous, and occasionally also into the serous, membranes of the body. In these effusions lies the chief danger of purpura, and the disease has thus two great divisions:—

Purpura Simplex and Purpura Hæmorrhagica.—In *purpura simplex* the disease runs a simple course, with little constitutional disturbance. A few spots are probably found dispersed over the body on awakening in the morning, but not aggregated. Two or three successive crops may thus form; and the disease usually subsides in from seven or eight days to a fortnight.

Purpura Hæmorrhagica is an aggravated form of the simple disorder, and in addition is specially characterised by an effusion of blood into those passages of the body lined with mucous membrane. Consequently, effusions are observed during life on the gums, tongue, and inside of the cheek; and, if the case ends fatally, they can be seen all over the digestive tract.

Necessarily, the constitutional symptoms are more intense, the fever higher, the general oppression more apparent than in the other form; and, in from twenty-four to forty-eight hours, spots are rapidly developed on the skin. These spots are of a bright red colour at first, but deepen into a purple red. The skin becomes tender and blotched, and scratching occasions bleeding.

The same exudation may take place into the mucous membranes from the first, but it usually follows after a few days. Oozing of blood, which it is sometimes difficult or impossible to check, may occur from the gums, while from the same cause there may be epistaxis, or hæmorrhage from the lungs, stomach, or bowels. Thus there may be great and fatal loss of blood, or simply weakness, anæmia, and pallor.

Diagnosis.—Purpura and scurvy may be confounded with one another. They agree in this, that they are due to some impoverished state of the blood which leads to effusion. They differ, however, as will be observed, in certain points.

Scurvy appears gradually, purpura suddenly and with some premonitory feverishness. Scurvy is essentially characterised by sponginess and lividity of the gums, while these conditions are absent in purpura. A dusky sallow complexion accompanies scurvy, but not purpura.

Further, scurvy is due mainly to the want of fresh vegetables, and can be cured by the administration of these.

No single error of diet, no single cause, originates purpura, and it can neither be prevented nor cured by the antiscorbutic remedies.

Treatment.—Ignorant of the cause, we can only treat purpura symptomatically. We have no specific, as in scurvy; yet, knowing that poverty, bad diet, fatigue, and defective ventilation, are great predisposing causes, it is obvious that a good nourishing diet, rest, and a well-ventilated room are essential.

Ten or twelve drops of dilute sulphuric acid, combined with one grain of quinine, may be given every two hours, or (F. 75). Tincture of the perchloride of iron in large doses seems specially serviceable in Purpura Hæmorrhagica.

When internal hæmorrhage occurs, the oil of turpentine, combined with creasote to prevent nausea, is necessary.

In cases of extreme anæmia there is danger of fatal swooning; hence the patient must preserve a horizontal attitude until all the prominent symptoms of anæmia disappear.

CHLOROSIS (*χλωρός, green*), ANÆMIA.

A high degree of pallor on exposed parts of the body in a person previously healthy and not naturally pale, has always some pathological significance; and when we perceive the lips, gums, and conjunctivæ bloodless, we say the person is anæmic. This anæmia is caused in every case either by a diminution of the volume of blood in circulation, by an unfilled condition of the capillaries, or by a deficiency in the number of red blood corpuscles.

1. The decrease of the quantity of blood may be direct, *i.e.* due to some hæmorrhage from the lungs, stomach, bowels, or uterus; or it may be indirect, caused by deficient supply or faulty assimilation of food, as in convalescence from all febrile and acute diseases, and in

many chronic complaints connected with the organs of digestion. Indirectly, also, pallor is associated with loss of albumen in chronic kidney diseases, and with considerable effusion into the pleuræ, pericardium, and peritoneum.

2. Extreme pallor may be occasioned by an unfilled condition of the capillaries, due to causes preventing the heart contracting with sufficient force. Thus terror or anxiety and emotional influences blanch the face; faintness may terminate in a swoon through feebleness or temporary cessation of cardiac action; fatty degeneration of the heart, or an engorged condition of the pulmonary vessels, consequent on mitral disease, may leave the left ventricle with less blood to propel than usual, and occasion a pale characteristic yellow hue all over the skin.

3. The *anæmia* due to a diminution in the number of the red corpuscles (*oligocythæmia*), combined with a deficiency of these blood-constituents in *hæmoglobin* (*oligochromæmia*), and associated with a green colour of the skin, is peculiar to young females suffering from disordered or arrested menstrual flow, and is termed "*Chlorosis*" or "*Green Sickness*." The time of its occurrence is usually between the ages of puberty and twenty-five, although it is also said by Trousseau to be observed at the *meno-pause*.

Symptoms.—The disease is revealed by certain symptoms, the most prominent of which are palpitation and a loss of colour, causing at first a pale sallow appearance of the surface, which may deepen into a greenish tinge—hence the name. With the palpitation there are often combined various abnormal murmurs in the heart and blood-vessels. A soft murmur following the systole is frequently heard over the base of the heart, and along the course of the ascending aortic arch. The pressure of the stethoscope on the veins of the neck, especially of the right side, evokes a peculiar hissing or droning sound (the "*bruit de diable*"). The respirations are frequent, becoming markedly increased by mental disturbance or bodily exertion; and the patient usually complains

of shortness of breath and inability to do anything, with loss of appetite, and pain and flatulence after taking food. Menstruation is generally deranged, being sometimes scanty or irregular, while frequently there is amenorrhœa; neuralgic pains in the face and head, or intercostal muscles, are often concomitants of the affection; and there is a special liability to perforating ulcer of the stomach.

The disease tends to recovery in the space of a month or two, unless it leads to the development of phthisis or gastric ulcer. Relapses are, however, common.

Some regard chlorosis as a nervous disease; others consider it due primarily to disorders of the reproductive or digestive system. In the majority of cases, not only is the quantity of blood in circulation probably diminished, but the red corpuscles may be reduced to one half their normal relative number. In others, not their number but their hæmoglobin is diminished. THERE IS NO ALTERATION IN THE PROPORTION OF WHITE CORPUSCLES TO THE RED, AND IN THIS THE AFFECTION IN QUESTION DIFFERS ESSENTIALLY FROM LEUKEMIA. Virchow noticed that in chlorosis the aorta was found abnormally narrow, with thin elastic walls; that there was frequently fatty degeneration of the muscular structure of the heart, and many other abnormalities in the circulatory system. A peculiar form of anæmia, unamenable to ordinary tonic treatment, and tending uninterruptedly towards a fatal issue, has been appropriately termed "Progressive Pernicious Anæmia." Its causes and pathology are shrouded in obscurity. It is most frequently met with in the female sex between the ages of 20 and 40, and in a relatively large proportion of cases after a rapid succession of pregnancies. The more prominent symptoms of this perplexing disease are extreme pallor, with but a small degree of emaciation; loud and persistent anæmic cardiac murmur; moderate dropsy towards the end of the disease; hæmorrhagic symptoms, particularly extravasation into the retina; and finally paroxysms of increase of temperature, the so-called

"anæmic fever." From its detection until its end, the disease seldom lasts less than six or eight weeks, or more than as many months.

Treatment.—Iron is indicated in all forms of anæmia if it can be assimilated by the system, and in chlorosis, however originating, it seems a specific. It requires to be carefully given for weeks or months, the first great leading fact in the cure being in females the establishment or re-establishment of the menses. It acts by restoring the functions of health, and by giving to the blood that in which it was deficient; and, consequent on this renewed vitality, the menstrual flow appears. Considerable controversy as to the mode in which it should be administered has taken place. The best plan seems to be to administer it for a fortnight in the form of the Ferrum Redactum; and if this is well assimilated, and leads to no digestive derangements, it may be replaced by a soluble preparation, as the tincture of the perchloride, or ammonio-citrate, or the sulphate, as in Blaud's pill (F. 77, 78, 78a). The remedy must be steadily persevered with, although if menstruation appears it may be discontinued for a week, and then recommenced. Even after the patient seems to have regained colour and strength, it is a wise precaution to give iron occasionally at appropriate intervals. Aloes and myrrh pills, if required, will check constipation, sometimes attendant on its use. Should diarrhoea, not constipation, be observed, nitrate of bismuth in 10 grain doses is beneficial. Many speak highly of dialysed iron in chlorosis, and trust to it entirely all through the treatment. It certainly has the recommendation of being easily taken, and of causing no blackening of the teeth, while it also seems to occasion neither diarrhoea nor constipation, but it lacks the essential astringent constituents of tinct. ferri perchloridi, and in my hands never has been successful in curing chlorosis.

Good food, a change of air, and moderate exercise, are also essential.

LEUCOCYTHÆMIA.

Dr. Hughes Bennett of Edinburgh first directed attention to this affection in 1848, and six weeks afterwards Professor Virchow detailed another case where similar phenomena were observed in the blood. Dr. Bennett called the disease leukæmia or white blood, and imagined it was due "to suppuration of the blood without inflammation." He subsequently modified this view and called the disease leucocythæmia (*λευκος* white, *κυτος* a cell, and *αιμα* blood), white-cell blood.

Pathology.—The pathology of the disease to a certain extent is expressed by the name, as there is a great increase of the white corpuscles of the blood, while the red ones are diminished. If an ounce of leucocythæmic blood, freed from fibrin, is placed in a glass, the red corpuscles sink to the bottom, while the colourless constitute the white milky upper stratum. Microscopically the excess mentioned is confirmed, and is more marked when the red corpuscles accumulate in rouleaux, leaving clear spaces filled with the colourless ones. The specific gravity is reduced. The disease is always associated with hypertrophy of one or more of the lymphatic glands, or of the spleen, or of both together. It is also sometimes associated with changes in the medulla of bone.

Symptoms.—Great pallor evidences leucocythæmia, and with the pallor there are weakness and emaciation, gradually increasing until death occurs. Ascites from the enlargement of the liver, spleen, or both, accompanies diarrhoea. Epistaxis, urine loaded with uric acid, nausea, and jaundice, have been noticed in cases which have come under observation. There may also be hæmorrhages from the bowels and urinary passages.

Treatment.—No remedy seems of any special avail in this disease. Of tonics, iron and quinine have appeared most serviceable (F. 77, 75). Good nourishing food should also be given. Diarrhoea and hæmorrhage should be treated as they arise, by appropriate remedies.

HÆMOPHILIA.

Hæmophilia (from *αἷμα* blood, and *φίλια* predisposition for). *Synonyms*—Hæmorrhagic Diathesis, Bleeders.

Hæmophilia is a congenital, often hereditary disease, characterised by a tendency to immoderate bleedings and to swellings of the joints. Men are more liable to it than women, the proportion being 11 to 1.

The best ascertained cause of hæmophilia is hereditary predisposition. In a "Bleeder" family the disease descends to the boys through the mothers—the women remaining quite healthy and very prolific. Fathers do not seem to transmit the disease to their sons. Cases of hæmophilia have been met with in all countries.

Symptoms.—Symptoms of the disease are seen in early life, as a rule in the first dentition. There are three well-marked degrees of hæmophilia—

1st, Swelling of the joints, common to men, rarely seen in women.

2d, Spontaneous hæmorrhages from mucous membranes only are present.

3d, Spontaneous ecchymoses.

The hæmorrhage may be spontaneous, and preceded by a sense of fulness and plethora; or it may be excited by trivial causes, as the extraction of a tooth, vaccination, and leeching.

The bleeding is nearly always capillary, and in some instances proceeds to a great extent. A simple bruise may fill the connective tissue with blood.

The swelling of the joints is most observed in the knees, commonly originating from some slight injury, and accompanied by fever and great pain, which may last for many weeks.

Prognosis is bad with regard to complete recovery. The disease is, however, rarely fatal to life.

Treatment.—Tincture of the perchloride of iron seems the best internal remedy. Meat diet, cod-liver oil, and a warm climate are also essential. All surgical or medical procedures attended by the abstraction of blood should

be strictly avoided. Marriages should be forbidden, specially to women who, although free from bleeding symptoms themselves, belong to a "Bleeder" family.

DIABETES.

The word *diabetes*, derived from the two Greek words, *δία βάλω*, literally means that the water is constantly running through the patient's system. Used in this sense, diabetes may have a wide significance, but it is now employed as representing two distinct kinds of disease. In both there is an increased flow of urine; but in the one, Diabetes Mellitus, there is sugar in the urine, in the other, Diabetes Insipidus, this is absent.

Diabetes insipidus (*Synonyms*—Diuresis, Polyuria) seems to depend on unknown causes, attacking by preference the male sex, usually between the ages of five and thirty. It has certain permanent and characteristic features, viz. an excessive flow of uncoloured urine of low sp. gr., containing neither sugar nor albumen, and attended with a dry skin and great thirst. Its course is uncertain, and its treatment empirical.

Diabetes mellitus, although it seems to have been known in some measure to the ancient physicians, was practically unrecognised until Dr. Willis, in 1674, described it as a distinct disease; "for in it the urine differed from all other fluids of the body, as if it had been mixed with honey or sugar, and having a powerfully sweet taste." Passing over subsequent years, it may be mentioned that Dr. M'Gregor of Glasgow in 1837 discovered sugar in the blood as well as the urine, "and that the stomach formed saccharine matter instead of healthy chyle, which entered into the blood, and instead of forming fat, bone, and muscle, was passed into the system as sugar, and thence eliminated by the kidney." Claude Bernard in 1848 opened up a new era in diabetes, when he pointed out how sugar was formed and excreted from the system. He found the blood of the hepatic vein to be rich in sugar, whilst the blood of the

portal vein contained no sugar whatever, or mere traces of it; and he further discovered sugar in the livers of animals fed entirely on meat. He concluded therefore that as the blood entering the liver contained no sugar, while that leaving it had it in abundance, sugar was formed in the liver under normal conditions. He subsequently discovered within the liver itself a substance closely resembling sugar in the arrangement of its elements, and readily changed into sugar under the influence of an animal ferment. This substance was GLYCOGEN, and around it he perceived centred the formation of sugar in the liver. For the transformation of glycogen into sugar was the result of a ferment of the liver, and so the hepatic veins carried the sugar-loaded blood to the inferior vena cava, whence it reached the heart, and where again it was transferred in the usual circulatory course to the lungs to be burnt up and consumed. If this oxidation was complete, sugar was not detected in the blood or in the urine; but if it was incomplete, sugar was observed in both, and the existence of diabetes mellitus could be recognised in the latter by its appropriate tests. Further, he showed that by puncturing or irritating the eighth pair of nerves at their origin in the fourth ventricle, an abnormal development of sugar could be produced; and this pre-eminently favoured the idea that the whole process of sugar-formation in the liver was governed by the nervous system. Such is a brief outline of Bernard's theory, and it has formed the point of departure for many theories of diabetes since broached.

This glycogenic function of the liver, the foundation of his theory, has been assailed notably by Pavy. He found sugar in the blood of all parts of the vascular system, in the hepatic veins, and in the tissue of the liver itself if immediately removed from the living animal and examined without loss of time. He found the sugar constantly increasing up to a certain limit from the beginning of death. It was thus a post-mortem process. He considers that the hydrocarbons taken with the food are normally stored up in the liver in the form of glyco-

gen, and this is not changed into sugar but into fat, which serves for the formation of bile. Under abnormal conditions glycogen is converted into sugar, and thus diabetes is produced.

Other theories have been advanced, but they may be said generally speaking, to be modifications or enlargements of the views of Bernard or Pavy. And these two theories again merge into the wider question, Does diabetes proceed primarily from the nervous system, or has it its origin in the intestinal canal or the liver? Is it neurogenic or hepatogenic? A dogmatic answer can scarcely be given. In all probability the great majority of cases of diabetes have a nervous origin, but that others proceed primarily from the digestive organs must be allowed. To enter into further details would provoke unnecessary digression in view of the plain fact that there are no constant post-mortem appearances in diabetes mellitus. The brain, the spinal cord, and the different internal organs have been searched, but in vain, for its cause. The liver and the kidneys, seemingly so much implicated, reveal nothing inconsistent with health. In a careful examination of nine cases in the Glasgow Royal Infirmary, Dr. Foulis found no confirmation of Dr. Dickinson's statement that there was a dilatation of the arteries of the brain followed by degeneration and excavation of the nervous substance in the neighbourhood.

The symptoms of diabetes are as patent as its pathology is obscure, for it may be suspected if there is thirst and an increased quantity of urine, with loss of weight, impaired physical and mental endurance, and disinclination for all sexual intercourse. The skin is dry, the tongue is hard, red, and cracked, the digestion is faulty, and the bowels constipated. Wandering and severe pains are frequently complained of in the muscles of the calf of the leg, and these pains sometimes prevent sleep. The temperature is low, there is a lack of interest in passing events, and a melancholy hopelessness as to the future.

The urine passed may rise to 15, 20, 30 pints, or more,

in the course of twenty-four hours, and it presents to the eye a pale colour, while its odour is sweet, like that of new-mown hay or that detected in a chamber containing apples. There is no sediment after standing, and this and the clear colour suggested to Dr. Prout the pertinent inquiry for fixing the date of the beginning of the disease by asking the diabetic patient "When did you last observe your urine muddy?" The effect of sugar is to increase the specific gravity, which in all cases of persistent glycosuria is above 1020, and in some instances rises to 1050. Is the existence of sugar in the urine in all cases indicative of diabetes? The answer to this is, Not always, for it may be found in certain other circumstances; as in cerebral injuries, tumours of the brain, meningitis, some liver affections, after inhalation of chloroform or poisoning by corrosive sublimate, or after eating saccharine materials in large quantities. In these cases it is temporary; in diabetes it is constant, although it may sometimes disappear should acute inflammation or fever supervene. How is sugar detected in the urine? By the following distinctive tests:—

Moore's Test.—Add half the volume of liq. potass. to the urine. Boil in a test-tube, when the mixture assumes a dark brown colour. Healthy urine is only slightly darkened by the same proceeding.

Trommer's Test.—Place some of the urine in a test-tube, add a drop or two of solution of sulphate of copper, when a pale blue tint is produced. Add to this liq. potass. in a proportion equal to half the volume of urine, when a pale blue precipitate of the hydrated oxide of copper is thrown down. Boil, and the result will be—

- 1st, The dissolving of the first precipitate;
- 2d, The throwing down of a yellowish-brown precipitate of sub-oxide of copper.

If there is no sugar there will be merely a black precipitate of common oxide of copper.

Fehling's Solution.—A more delicate test consists in what is termed Fehling's solution, consisting of sulphate of copper, tartrate of potash, and caustic soda (F. 92).

Boil a small quantity of the solution, then add a few drops of the urine, when, if sugar is abundant, the same yellowish-brown precipitate as in the former case will result. If equal quantities of urine and of the test are used, and no change ensues, then there is not $\frac{1}{10}$ of a grain of sugar present.

How is the quantity of sugar excreted estimated? The most convenient way is by the differential density method of Roberts.

Roberts' Test.—Collect the total quantity of urine passed in the twenty-four hours, and take its specific gravity, which note. Place some German yeast with a sample of this urine in a bottle, and then cork and invert it on a saucer also containing some of this urine, and put it at the side of the fire or in a temperature of 80° Fahr. Fermentation ensues. The sugar is decomposed into alcohol and carbonic acid. The acid is liberated, and collects in bubbles in the neck of the inverted bottle, which should in consequence be wide and afford sufficient space for its doing so. The loss of sugar occasions a loss of density, and the difference is equal to the amount of sugar per ounce.

Thus,—Fermented specimen = 1010

Unfermented specimen = 1040

Loss = 30 = 30 grs. of sugar per ounce.

This quantity—30 grains—multiplied by the total amount of urine passed in twenty-four hours, will give the excreted sugar by the system in that period. Then, if 100 ounces of urine is passed, $100 \times 30 = 3000$ grains of sugar excreted.

For the exact volumetric estimation of the sugar excreted, the following method may be taken. A sample of the total urine of twenty-four hours is taken and diluted with nine parts of water; place this diluted solution in a graduated pipette, and note the point at which it stands. Place a measured quantity of Fehling's solution, equal to a given weight of sugar, in a flask, and dilute it to 3 ozs. or 100 c.c., boil, and add drop by drop the diluted urine

from the pipette. When all trace of blue colour has disappeared from the fluid in the flask, the quantity of dilute urine added is noted, and from this amount the total weight of sugar excreted may be calculated. It is necessary to stop occasionally to remove the flask from the flame to allow the cuprous oxide to subside in order to see if there be any blue colour remaining; a yellow tint in the fluid indicates that an excess has been added. Suppose the formula for Fehling's solution given in the appendix be used, and 200 grs. of the solution be taken for an experiment, and suppose 100 gr. measures of the diluted urine were necessary to remove the copper from solution, then 100 grs. = 10 grs. urine

$$10 \text{ grs. urine} = 1 \text{ gr. sugar}$$

$$1 \text{ oz. or } 480 \text{ grs. urine} = 48 \text{ grs. sugar.}$$

Thus it is seen that each ounce contains 48 grs. of sugar, and this amount multiplied by the number of ounces passed gives the total weight of sugar excreted.

Pavy's Test.—Dr. Pavy has modified and improved upon Fehling's method of analysis. Students find great difficulty in ascertaining by Fehling's method the exact moment of disappearance of the blue colour due to cupric copper on account of the turbidity and red tint imparted by the precipitated cuprous oxide. Dr. Pavy's method consists in the addition of a sufficient quantity of AMMONIA to the copper-solution to prevent the precipitation of the cuprous oxide after its production by the reducing action of the glucose. The ammonia altogether prevents the precipitation of cuprous oxide, and in a clear solution the exact amount of sugar required to completely decolorise the cupric blue tint may be much more easily determined. The chief precaution necessary is to completely exclude air during the determination of the amount of sugar by Pavy's process, because a colourless ammoniacal cuprous solution is rapidly rendered blue by exposure to atmospheric oxygen, the cupric hydrate being thereby reproduced. 10 cubic centimetres or 100 minims of the cupric fluid of Pavy represents exactly 50 milligrammes and half a grain of sugar respectively.

The quantity contained in the diluted urine being thus deduced, multiply this by ten (if the urine has been diluted ten times) to get the quantity contained in the urine as passed, next multiply by the total quantity of urine passed in twenty-four hours to ascertain the full amount of sugar passed in this period.

Picric Acid and Liquor Potassæ Test.—To understand accurately the picric acid and liquor potassæ test of Dr. George Johnson, it will be necessary to give in the main his own words, although the facts to be afterwards mentioned have been corroborated in every particular by the author for his own satisfaction.

It is essential first to remember what occurs when the tests mentioned are BOILED with normal urine, *i.e.* where no albumen or sugar exists. To one fluid drachm of normal urine is added half a drachm of liquor potassæ, and forty minims of picric acid solution.¹ The fluids are boiled 60 seconds, and the result is a BRIGHT CLARET COLOUR. And the reason for this is, that all normal urine contains some sugar, which, when boiled with the tests of picric acid and liquor potassæ, reduces the yellow picric acid to the deep red picramic acid, the depth of the colour resulting depending on the amount of sugar present.

By this reaction an accurate estimate can be made of the amount of sugar in a given quantity of urine.

It is found, however, that the CLARET COLOUR mentioned as resulting from the change of picric acid into picramic acid is not permanent, but alters on exposure to the air. It has been therefore considered necessary to adopt an artificial solution, which will exactly correspond to the CLARET colour mentioned, and experience has shown that by mixing the following solutions, such a colour is obtained, which may be kept for months without change. The Liquids are

Liq. Ferri Perchlor. Fort. (sp. gr. 1.338) ʒi. ;

¹ The method of obtaining the picric acid solution is mentioned under diseases of the kidney, p. 320.

Liq. Ammon. Acet. (sp. gr. 1·017) ℥iv. ;
Acid. Acet. Glacial. (sp. gr. 1·065) ℥iv. ;
Liquor Ammoniaë (sp. gr. 0·959) ℥i .
Aquaë destil. ad ℥iv.

THE COLOUR OF THIS STANDARD SOLUTION IS EQUAL TO A QUARTER OF A GRAIN OF GRAPE-SUGAR TO THE OUNCE.

If now a drachm of a solution of grape-sugar, containing *two* grains to the ounce, be mixed with the same quantity of liquor potassæ and picric acid solution, as previously mentioned, and made up to four drachms in the boiling tube, the result of boiling the mixture as before for 60 seconds will be the production of a much darker colour than when one-grain solution was acted upon ; but, if now the dark liquid be diluted with its own volume of water, the colour will be the same as that of the one-grain solution.¹

To ascertain the quantity of sugar present in diabetic urine, the urine having been diluted four times before it was boiled, a colour equal to that of the quarter-grain standard would indicate one grain of sugar per fluid ounce. If further dilutions were required—say from ten to twenty divisions—the proportion of sugar would be two grains per ounce, and so on to thirty or forty or upwards, or to intermediate divisions. Thus, dilution from ten to thirty-five divisions would indicate 3·5 grains of sugar per ounce.

It has been found by experiment that ten minims of a cold saturated solution of picric acid are rather more than sufficient for decomposition by one drachm of a solution of grape-sugar in the proportion of one grain to the ounce.

A drachm of the solution would, of course, contain

¹ In the dilutions afterwards referred to, Dr. Johnson employs a stoppered tube, which is termed a "saccharometer," 12 inches long and $\frac{1}{4}$ of an inch in diameter, graduated into 10 and 100 equal divisions. By the side of this tube and held in position by a s-shaped band of metal is a stoppered tube of equal diameter and six inches long, holding the standard iron solution.

one-eighth of a grain of sugar. In making an analysis the picric acid must be added in proportion to the amount of sugar. If the proportion of sugar be as high as six grains per ounce, a drachm of the picric acid solution will be required. If the proportion of sugar be higher than this, the saccharine fluid should be diluted with distilled water, in a definite proportion, before commencing the analysis, and the product of the analysis of the diluted fluid is then to be multiplied by the degree of dilution—two, five, or ten, as the case may be, to which the original fluid has been subjected. When the urine has been diluted ten times, the figures on the "saccharometer" indicate the number of grains per ounce. Thus, when the ten times diluted urine, after boiling with picric acid solution and liquor potassæ, is further diluted from 10 divisions to 35 to obtain the standard colour, the amount of sugar is 35 grains to the ounce.

To reduce the amount of sugar per ounce to the proportion per cent we have to remember that an ounce of water at 0° Cent. weighs 437·5 grains. If now the proportion of sugar is 40 grains per ounce, then, as

$$437\cdot5 : 100 :: 40 : 8\cdot79.$$

For bedside sugar testing (based on the principles indicated, picric acid and liq. potass. being boiled with the suspected fluid) it is convenient to carry picric acid in powder and grain lumps of caustic potash, and a test-tube graduated up to 3 drachms. Then put into the test-tube about a third of a grain of picric acid, as much as can be carried on the point of a penknife, and then add half a drachm of water. The acid is dissolved in the water by heat, and now, if half a drachm of urine is added and *no* turbidity ensues, it shows that no albumen is present. Then add a grain lump of caustic potash, and boil for a few seconds.

In normal urine the resulting colour will be somewhat darker than the $\frac{1}{4}$ -grain standard colour until dilution with water is carried up to the 12-minim mark

above the drachm, indicating 0.6 grain per ounce. If the colour be still darker more water is added.

If dilution to 2 drachms gives the $\frac{1}{4}$ -grain standard colour then the sugar is 1 grain to the ounce—the urine having been diluted from half a drachm to 2 drachms; dilution to the 3-drachm mark would indicate $1\frac{1}{2}$ per ounce. If the colour is still darker than the standard the urine must be diluted before being tested in the manner previously mentioned. Thus 5 or 10 minims of urine may be diluted up to 10 or 20 or more times the volume with water. The diluted fluid is then tested in the small graduated tube, and the result multiplied by the number of dilutions. If, after boiling a ten times diluted urine, as directed, with picric acid and liquor potassæ, the standard colour is reached by dilution to the 1-drachm mark, there will be 5 grains of sugar per ounce. If dilution up to 2 drachms is required, the amount will be 10 grains; to the 3-drachm mark 15 grains; and for the intermediate dilutions the amount may be estimated with a near approach to accuracy.

Indigo Carmine Test.—Dr. Oliver of Harrogate has brought this test before the profession. It is easily applied. Test papers dipped in a solution of indigo carmine with carbonate of soda, and dried, when boiled with a specimen of saccharine urine will display a blue colour at first; but, as the boiling proceeds, this changes from blue to violet, purple-red, yellow, and finally straw colour. After cooling and exposure to the air the liquid passes back through the various colours to the original blue. A carbonate of soda test-paper introduced at the same time increases the delicacy of the indigo carmine test.

The COURSE of diabetes is chronic. It is free from fever and the morbid process may come to a standstill. The prognosis is more grave in young subjects than those after thirty, and statistics show that though its duration may extend over several years, yet three-fourths die in from six months to three years after its first detection; and how? By exhaustion, by cedema of extremities, phthisis,

pneumonia, bronchitis, carbuncles, abscess, gangrene, or through inflammation of serous membranes of an asthenic type, or more commonly death takes place in a few days with coma. This coma is not uræmic, for there is an uninterrupted flow of urine to the last, with no marked twitching of the muscles, and the temperature is much lower than normal. It seems a kind of poisoning, and is probably due to the acetone developed in the blood, for acetone given in large doses to animals produces similar results. Hence the term "Acetonæmia" applied to it.

Cataract, which is associated with advanced cases of diabetes, comes on suddenly, and out of two hundred and twenty-five collected cases was detected twenty times. It attacks both eyes, and seems due to the direct action of the sugar influencing the nutrition of the crystalline lens. Other ocular affections, as paresis of accommodation, amblyopia, hemiopia, retinitis, and optic-nerve atrophy are common sequelæ from this disease.

Treatment.—The great principle in the dietetic treatment of diabetes is to vary the diet, and to stick to no hard-and-fast rule. Vegetables are injurious, but all vegetables are not equally so, for experience has shown that green vegetables can be taken without injury. A general rule with regard to vegetables may be thus expressed. ALL GREEN VEGETABLES OR GREEN PARTS OF VEGETABLES MAY BE EATEN, FOR WHEN CHLOROPHYLL OR GREEN-COLOURING MATTER IS ABUNDANT, THEN SUGAR AND STARCH ARE SCANTY. Thus spinach, the green parts of celery and asparagus, Scotch kale, cabbage, watercress, lettuce, and all kinds of green salad may be taken. Cauliflower is doubtful. French beans may be used entire when young; or, when older, by removing the beans. Haricot beans, peas, all cereals, potatoes, carrots, turnips, parsnips, and beetroot, are forbidden. Sugar will produce sugar, but substances sweet in themselves and nearly allied to sugar fail to increase saccharine urine. There is a craving for sweets, and we find that animal fats and glycerine satisfy this to a great extent. Diabetic bread is dry, and diabetic tea

is insipid; hence soften the former with butter and sweeten the latter with glycerine. Flesh meat, fowls, and fish, form important elements in the daily fare. Cheese may be given, and also eggs, especially the white. The patient may drink moderately of seltzer water, and to this may be added daily 4 to 6 ounces of brandy and whisky to aid digestion. Ordinary milk contains about 4 per cent of sugar, yet it is found that neither milk nor cream notably increases the quantity of sugar, and to many a milk diet is very grateful; all sweet wines—champagne, port, or sherry—should be avoided, yet red wines can be taken. Eschew also, as far as possible, highly farinaceous articles—bread, rice, sago, tapioca, and arrowroot. A pleasant form of biscuit suitable for diabetics is prepared by Walker, Glasgow, and can be highly recommended. It is made from gluten and eggs, and is very palatable. It is now used in most cases of diabetes in the two hospitals of Glasgow. Medicinal treatment has failed as yet to arrest the sugar formed in diabetes, though many drugs have been tried, including lactic acid, carbolic acid, creasote, tincture of iodine, arsenic, iodide of potassium, and the various preparations of opium. Of the latter, codeia in half-grain doses and upwards seems certainly to have the effect of reducing the quantity of urine; but it does so at the expense of the appetite, for the patient will be found to become weaker and lose weight by its continuance. Without entering into details, I may state that I have found the following treatment to fulfil the two chief indications required, viz. relief of thirst and consequent diminution of urine, thereby causing increase of weight and subsequent restored mental and bodily vigour.

1. $\frac{1}{20}$ of a grain of nitrate or hydrochlorate of pilocarpine is placed on the tongue thrice daily. This causes increased salivation and what a Scotch diabetic terms "sappiness" of the mouth.

2. Five grains of pepsine and 20 of dilute hydrochloric acid are taken after every meal for three weeks.

3. This is followed by a mixture of phosphates as (F. 91a), which is continued for months.

4. If there is not a natural action of the bowels daily, an enema is always insisted on.

5. If the patient can afford it, a yearly visit should be paid to Carlsbad or Vichy, or Neuenahr or Vals, for it is found that patients using these waters void little sugar, and can take vegetable diet with comparative impunity.

FEIGNED DISEASES.

Much of the success of a medical practitioner depends on his being able to detect the early symptoms of any disease, and to base his treatment accordingly. Occasionally, diagnosis is very difficult; and, in the case of the exanthemata, it is well not to make a strong assertion until the characteristic eruption appears. In other instances, under the influence of a weak nervous organisation, certain diseases may be feigned, through as it were paralysis of the will and with no deliberate intention to deceive. Hypochondriasis and hysteria furnish notable examples of such cases; and paraplegia, incontinence of urine, joint affections, and anæsthesia or hyperæsthesia of the skin may be assumed. Marked sympathy being shown him or her, usually the latter, such a patient may become bed-ridden. The treatment, if the diagnosis is correct, is plain—strong measures and not drugs being the principal agents by which to effect a cure, and so restore an apparently afflicted person to sense and reason and action.

But in a third class, of what may be more properly termed "Feigned Diseases," there is deliberate imposture. Thus blindness, deafness, paralysis, or epilepsy may be assumed; and jaundice and insanity counterfeited. It is important to remember that in the majority of cases the impostor overacts his rôle. Blindness, deafness, or paralysis assumed are not proof against some sudden shock or mental impression. In jaundice, though vomiting may be induced, yet the conjunctivæ of the eyes cannot be made yellow. In epilepsy, if a fit occurs, it is too much

prolonged, the tongue is not bitten, and there is a vast amount of struggling without any actual injury, conditions not seen in a true epileptic fit. In feigned insanity no definite rules can be laid down. Common sense and experience must guide the practitioner, and no doubt the benefit of a specialist in mental diseases should be sought. When incontinence of urine is simulated, it is often found that the urine does not dribble away but is attended with an expulsive effort; and in feigned hæmoptysis there is no proper streaky admixture of blood with mucus.

DISEASES OF RESPIRATORY ORGANS.

Accurately and intelligently to understand these, it is necessary to be familiar with the meaning and importance of certain terms which are met with in the description of diseases of the chest. The air in breathing passes into the trachea, the wall of which is comparatively rough in three-fourths of its circumference, with strongly-marked cartilaginous rings, and the current of air entering is great and quick. Below the bifurcation of the trachea the bronchi divide into smaller and smaller tubes; the cartilaginous rings become less and less distinct, until, in the terminal ramifications of the bronchi, they cease to exist, and the tubes are smooth on their internal surface.

If the stethoscope is placed over the trachea, two rough harsh sounds of equal length will be heard, the one accompanying inspiration, the other expiration, with a distinct interval between them. This is what is termed "tracheal or cavernous respiration."

Next, on placing the stethoscope on the upper bone of the sternum, opposite the point at which the trachea divides into the bronchi, we hear a modification of the tracheal breathing, the character of the sound being hollow, blowing, and soft, and with the inspiration rather longer than the expiration, and they are still separated by a slight but appreciable interval. This is "bronchial respiration" or "tubular breathing."

Again, on listening over other parts of the chest, it will be found that the blowing character is gone, that the inspiration is soft and gentle, that the expiration immediately follows it, and is less prolonged. The combination of the two constitutes the healthy vesicular murmur.

If the person is told to speak when the stethoscope is at the different situations mentioned, it will be found that the character of the voice also varies. Thus, over the trachea it seems as if he were speaking right into the ear, so loud and full is the sound; even a whisper can be heard. This is "pectoriloquy."

Over the sternum it is still distinct and clear, but not so loud. This is "bronchophony."

Over other parts of the chest, on the other hand, a buzzing scarcely audible sound is heard.

These sounds, as will be seen, are significant of various diseases when heard in parts of the chest, where in health they are not detected.

The mucous membrane lining the respiratory tract is in health moist, but not too much so, else this also would give rise to disease. As illustrating terms used, and various conditions, let us suppose a common cold is caught. The effect of this on the mucous membrane of the respiratory tract, if it extends to it, is, firstly, to make it dry; secondly, swollen and inflamed. The consequence is an alteration in the character of the sounds where the vesicular murmur is heard. If the larger air-tubes are alone involved, a deep-toned note will be produced like that of a person snoring in sleep, or a humming like that of a spinning top; hence it is often described under the terms cooing, snoring, buzzing, or technically, "sonorous rhonchi." If the dryness extends to the smaller air-tubes, the sounds are shriller in character—piping, whistling, hissing, or technically, "sibilant rhonchi." These sounds may occur separately or together, and, if together, there is frequently a combination of the characters of both heard on auscultation, giving rise to a strange medley of cooing, whistling, piping, and snoring.

The mucous membrane in a cold, although still in-

flamed, does not remain dry, but becomes moist, and hence the dry sounds are replaced by moist ones. The air passes through liquids, and, in doing so, gives rise to bubbles; and to these liquid sounds the term "râles" is applied. If these are fine, and confined to the smaller air-tubes, the term "small crepitation" is used; if on a larger and coarser scale, involving the larger air-tubes,

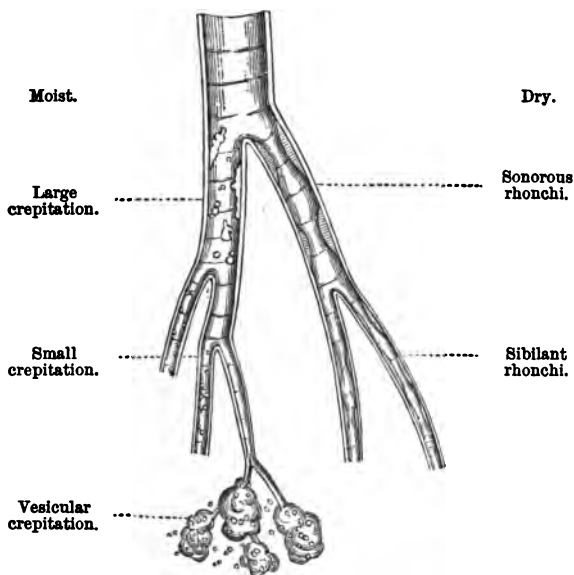


Fig. 5.

they give rise to "large crepitation." These two liquid sounds may and often do merge insensibly into one another, so that they are often heard in the same chest during the same complaint.

It will thus be observed, as the above diagram will show, that we have "sonorous rhonchi" and "large crepitation" as representing the dry and the moist sounds

of the larger air-passages; "sibilant rhonchi" and "small crepitation," in a similar manner, being applied to the smaller air-passages.

Leaving the mucous membrane as seen in its inflammation from a common cold, we may say further that moist sounds are produced by bubbles of air traversing or bursting in a somewhat viscous fluid. Hence they may be formed, not merely in the bronchi, but in the terminal air-vesicles, or on a larger scale in cavities or ulcers of various sizes. They may thus be fine, scarcely audible, or coarse, resembling gurgling and splashing, and between these two extremes there are various gradations; hence such terms as "sub-crepitant," "muco-crepitant," etc.

The chest in health on being percussed gives everywhere a clear reply; the note on both sides being similar in similar situations, unless where on the left side the heart intervenes. In the course of some diseases it will be found that one side is more expanded or retracted than the other, and it is necessary to estimate the exact difference between them. For this purpose mark with ink the central spots over the spinal vertebræ and the sternum, and stretch a graduated tape between them on both sides, telling the patient to hold his breath during the experiment. In cases where there is any difference note whether it increases or diminishes at regular periodical visits. If your hand is placed over the chest when the patient speaks, a distinct vibration is communicated to it. This is termed "vocal fremitus," which sensation may be altered by disease.

INFLUENZA.

This term is of Italian origin, indicating something fluid or transient, and was first applied by Pringle in 1752 to designate a disease, epidemic in its nature and attended with catarrh, especially affecting the respiratory and digestive organs. It can be traced back with certainty only to the sixteenth century, and since then ninety

epidemics of more or less severity have been described. Its universality in later years has greatly diminished. An epidemic has not been noted for some time.

In 1837 it was very prevalent in London ; nearly the whole population was attacked, and the mortality was great.

The cause of the disease seems to be *sui generis*, and dependent on some poisonous influence in the atmosphere, the nature of which is unknown. Influenza rarely ends fatally, and, when it does, reveals no characteristic post-mortem features, there being simply swelling and redness of the respiratory tract, with signs of hyperæmia also in the œsophagus and stomach.

Symptoms.—The onset of the disease is sudden, hence the term “lightning catarrh.” There is first a chill and malaise for several hours, followed by fever most marked at night. There is also a dry tormenting convulsive cough, with a fulness of the head, redness of the conjunctiva, throat, and mouth, and swelling of the tonsils and difficulty of swallowing. The sputa are scanty and muco-serous. There is intense prostration from the first, with dragging pains in the limbs and utter inability to move about.

The disease lasts four or five days, and usually terminates in a critical sweat, with diarrhœa and an increased secretion of urine. During an epidemic of influenza the death-rate of a town is increased, especially among the aged and feeble, through its setting up acute bronchitis or inflammation of the lungs.

The great number of persons attacked and the severe prostration distinguish influenza from an ordinary catarrh, with which alone it can be confounded.

Treatment.—By rest in bed, quietness, and a stimulating expectorant, influenza is best treated. Opium, inhalations of steam, and counter-irritants, are useful for the cough. Relief will be afforded to the headache by smearing the face with fat or snuffing up a solution of morphia in the proportion of 1 to 50 or 60 of cherry laurel water. During convalescence give quinine and iron. The diet should consist of mucilaginous drinks

and nourishing soups, with stimulants when the debility is great (F. 43).

CROUP.

Two forms of croup are recognised. One form, having no inflammatory cause, no structural change, is considered to be of a nervous origin. It is termed "false or spasmodic croup," or "laryngismus stridulus." In the other form, true croup, there is a local and catarrhal inflammation of the larynx or trachea, and this inflammation is accompanied by an exudation of false membrane on the parts attacked.

Inflammatory or true croup is a disease of early life; for, although it may occur at any time between weaning and puberty, its most common epoch is in the second year of childhood. It seems to attack boys more frequently than girls.

The chief seat of croup is said to be the trachea, but it may extend from this to the smallest bronchi, and hence bronchitis or pneumonia may complicate croup. The vessels of the mucous membrane of the trachea exude a material which stiffens and forms a layer of false membrane. In some cases it can be wiped off easily, in others it requires force to remove it; hence it is said to be thick or thin, diffuent or consistent. This stiffened croupal formation obstructs the breathing directly, gives rise to a spasmodic contraction of the muscles of the larynx, and diminishes the calibre of the air-tubes. Serious results from these causes ensue, and in addition shreds of the false membrane partially detached may produce fatal spasm. The inflammation is essentially a simple non-specific or fibrinous one, confined to the surface, and hence distinct from the diphtheritic.

Symptoms.—A premonitory feverish catarrh, such as occurs in other chest affections, may attract attention. If this catarrh be accompanied with hoarseness in young children, croup is to be apprehended. Preceded or not by this feverish cold, when croup is well established it is characterised by marked symptoms. The cough is brassy

and ringing; the inspiration is loud and crowing; and the fauces are observed to be red and swollen.

As the disease advances the fever increases, and from the obstruction to the passage of air and the proper arterialisation of the blood, the skin gets dusky, the feet cold, and the pulse feeble.

The character of the cough ceases to be ringing, and becomes husky. There is great irritability and restlessness, the child frequently attempting to thrust its finger down its throat to take away the obstruction. If the case proceeds to a fatal termination, the breathing becomes more and more laboured, the face pale and livid, cold clammy sweat forms, and drowsiness deepens into coma and death. Favourable symptoms are, the cessation of the crowing inspiration; the cough becoming moister, and accompanied by expectoration of false membrane. Croup is thus well described by Steiner:—

“A distressing restlessness seizes the poor child. Lying or sitting in bed, he impetuously begs to be taken in the arms of his mother or nurse, and then immediately to be put back to bed again; he tosses his hands and feet about; springs up in bed, or convulsively grasps the side of his crib; frequently clutches his neck, as if to remove the obstacle to his breathing, and throws off the bed-clothes; the face expresses great anxiety, and not unfrequently is even distorted; the eyes protrude; the frontal veins are swollen, and the respiratory muscles taxed to their utmost capacity; in a word, we have before us the heart-rending picture of a child nearly suffocated, tortured with the death-pang—a picture which draws out all our compassion, and brings home to us, as few other diseases do, the painful side of our calling.”

The duration of croup is usually five days.

Diphtheria and croup are closely allied, yet they are supposed to differ in this, that diphtheria is epidemic and contagious, is not so sudden in its attack, is not limited so much to the trachea as croup, but, beginning at the pharynx, may so spread as to involve the whole respira-

tory tract, and the membrane may be found in other regions ;—that, in fact, according to one theory, it is a specific constitutional disease, with throat complications ; while croup is a local disease, giving rise to constitutional symptoms.

Further, diphtheria is accompanied often by albuminuria and swelling of the submaxillary glands, and is followed by paralytic sequelæ. It is also much more asthenic than croup. The membrane in croup does not appear so often as in diphtheria. In fine, the clinical distinction between the two diseases must lie in a careful estimate of the general symptoms, the affection of the glands and kidneys, in the non-contagiousness, and partly also in the sporadic appearance of the croupous inflammation.

Treatment.—Formerly leeches were always applied in cases of croup ; now the most consistent line of practice seems to use them only when children are vigorous and plethoric. Leeches cannot stop the exudation, but they seem to prevent the swelling and infiltration, which might prove fatal. They are applied to the manubrium sterni, not to the larynx, as the bleeding there may be difficult to restrain. They ought never to be applied to puny and badly-fed children. Emetics are useful, and of these the sulphate of copper is to be preferred to zinc, as tending less to weaken the system. 10 to 15 grains of the former should be dissolved in 2 ounces of water, and a large teaspoonful of this given every five minutes until vomiting is produced. Ipecacuanha may also be used—a teaspoonful of the wine being given at frequent intervals until the child vomits (F. 42).

If the vomiting relieves the dyspnoea and expels the false membrane, it has done good and ought to be repeated. If it fails in these objects its repetition is contra-indicated. A solution of nitrate of silver should be applied at intervals of several hours to the entrance into the larynx. The bowels should also be acted on either by an enema or calomel. If, with the addition of a warm bath, hot pack, or hot sponging, these means fail, after a trial of twelve hours, tracheotomy should at once

be resorted to. Niemeyer says, "If it does not cure, it makes death less terrible."

The diet should consist of milk and nourishing soups. Inhalations of simple steam or medicated vapour, containing hops, chloroform, or benzoin, are often pleasantly palliative (F. 52).

When the disease has terminated favourably, the cough should be encouraged by a mixture of carbonate of ammonia and squills, in an infusion of senega (F. 44).

"The terms croup and diphtheria are not synonymous. The former should be exclusively clinical in its significance as descriptive of a certain train of symptoms; the latter being used only to describe the conditions which may be set up by the diphtheritic process. A diphtheritic membrane covers an ulcerated surface. A croupous or fibrinous exudation may be simply inflammatory, giving rise to casts but still leaving no ulcerated surface beneath it, when stripped off. The removal of the fibrinous membrane in croup may give permanent relief; but in diphtheria depending on wider and deeper causes it only affords a questionable and non-abiding recovery from grave symptoms" (Virchow, *Medical Times Gazette*, March 21, 1885).

DIPHTHERIA.

Although this disease seems to have been well known to the ancient physicians, yet its existence in England under the term diphtheria (a skin or membrane) dates back only to 1856, when it spread from France to this country. The first accurate investigations into the nature of diphtheria were made by M. Bretonneau in 1821. He considered that it was wholly a local disease, spreading by contagion through the inoculation of the soft mucous membrane with the diphtheritic secretion. He was subsequently obliged to concede that blood-poisoning is one of its essential characteristics. Much controversy has been excited as to the causation of diphtheria, which hinges round the inquiry, Is it a local or constitutional disease in its origin? Does the constitutional disease

cause the local exudation ; or does the local exudation originate the constitutional disease ?

In support of the first hypothesis, the epidemic character of the disease has been insisted on ; the grave and serious disturbance of the system, with only a few minute exudations observed on the fauces, and the impossibility of destroying the diphtheritic process by any amount of cauterisation.

In support of the second hypothesis it is urged that diphtheria fixes itself at the point of inoculation, as shown by experiments on animals, and radiates thence all over the body. Thus it is seen earliest and most constantly on the parts swept over in the acts of respiration or eating and drinking, when it attacks the human subject. Further, the diphtheritic process is always associated with vegetable organisms (micrococci), and their development poisons the blood. These organisms are present in delicate ring-shaped grayish-white spots, scarcely rising above the level of the mucous membrane in the first hours of the disease, penetrating the cells of the different epithelial layers, and pushing them out. Pus and fibrinous exudation do not appear until the disease has advanced farther. Inoculation with diphtheritic material containing these micrococci on the cornea of a rabbit produces intense keratitis, killing the animal on the fourth or fifth day by secondary general infection. So also they spread over the mucous membrane of the trachea, beset the cellular elements, crowd upon the young exudation cells and destroy them ; they fill the blood and lymph vessels, jamming up the fluids and producing serous exudation. So also they appear in severe cases in the kidneys, causing inflammation with ruptured vessels and the formation of epithelial casts in the tubes.

If the membrane, on the other hand, is finely divided, passed into Pasteur's fluid, and filtered, negative results are obtained on repeated inoculation of the cornea. These micrococci are thus, it would appear, not of accidental occurrence, but are inseparable from the diphtheritic process. "Without micrococci," says Eberth, "there can be

no diphtheria." The action of this matter on the tissues begins the moment it comes in contact with them, and the appearance of constitutional disturbance (fever) is brought about when these processes have reached a certain degree of intensity, and involved a sufficient extent of tissue. In artificial inoculation the grayish discoloration can be detected in from twelve to twenty-four hours; in diphtheria caught in the ordinary way, about the third day.

Without entering further into the controversy, it may be stated that the results of diphtheritic inflammation are peculiar. Redness and swelling of the parts affected are succeeded by patches of lymph, which start from one or several points. This lymphous exudation is of a grayish ashy-white colour, and its consistence is like that of wetted parchment or damp wash-leather. It can be stripped off, leaving a raw and bleeding surface, which is again speedily covered over with the characteristic exudation. Not merely is there exudation, but there is often also on the site of the exudation marked ulceration, sloughing, or abscesses. Further, it may be stated that diphtheria seems to spread by direct contagion, and that bad hygienic conditions, especially defective drainage, appear, if not actually to originate it, at least to foster its occurrence.

Symptoms.—The general features of diphtheria are prostration, restlessness, and muscular debility, with headache and nausea, and a sense of stiffness and soreness about the neck and the angles of the jaw. Further, there is often marked blanching. The local effects of the disease are manifested by the exudation which appears first on the tonsils, and from thence spreads in different directions. Thus it may creep backwards and upwards into the posterior nares; or, more frequently, it passes over the epiglottis into the larynx and trachea. As it attacks parts so intimately connected with life, the local gravity of the disease is obvious, and death may be caused by suffocation; or, on the other hand, the grave constitutional disturbance may result in death by asthenia, either directly or through paralysis of certain nerves.

The tongue is generally not much furred, the breath is foetid, saliva dribbles from the mouth, and there is great difficulty in and disinclination for swallowing. The sub-maxillary glands are enlarged, and, owing to the extension of the disease to the larynx, difficulty of breathing is a common late symptom. What causes this dyspnoea? Though much controversy has arisen about this, yet it may be safely said, that the best explanation is, that it is due to the combined result of several causes acting together or in succession—the most important of these being the mechanical one, viz. the swollen mucous membrane on the one hand, and muco-purulent secretion on the other, obstructing the narrowed glottis. To these purely mechanical causes must be added another of subordinate importance, viz. the paralysis of the laryngeal muscles. The fever is not great. The urine is found ALBUMINOUS in fifty per cent of the cases.

In non-fatal cases the specific disease is supposed to terminate on the seventh day, although the convalescence after this is slow and attended with great depression. After the complete healing of the local lesions, in the course of the second or third week of the disease various sequelæ may ensue, viz. paralysis of the soft palate and pharynx, and paralysis of the muscles of the larynx, occasioning in the one case difficult deglutition, in the other impaired voice. Sometimes there are great disturbances of vision and progressive paralysis of the extremities.

The course of the paralysis mentioned is gradual and characteristic, paralysis of the soft palate and pharynx being first noticed. This is followed, either immediately or shortly afterwards, by impaired vision, while paralysis of the upper and lower extremities occurs later. The ordinary termination of diphtheritic paralysis is in cure, and it is also noteworthy that the muscles which were first paralysed are also the first to recover their activity. The process of cure occupies from six or eight weeks to two or three months. A fatal termination has been noted in eight to ten per cent of diphtheritic paralysis cases, but then only through intercurrent diseases, or from

food entering, through paralysis, into the larynx, causing suffocation, or possibly pneumonia.

Treatment.—If, as later investigations indicate, diphtheria is at first a localised disease with after constitutional symptoms, it is obvious that treatment must be local and general. Tearing off the membranous exudation is absolutely negatived, and even thorough cauterisation has not been attended with much success. It is said that nature unaided in diphtheria tends to heal by supuration, and that in this way the false membrane is rejected. Hence it has been suggested by Oertel to imitate nature and to establish a rapid and abundant production of pus by means of hot inhalations in quarter-hour sittings every half-hour, with nourishment supplied during the intervals, a longer time being allowed to elapse as the membranes are thrown off. In addition the mouth should be rinsed and the throat gargled with a solution of carbolic acid or permanganate of potash (2 grains to 3i of water).

The marked and rapid physiological action of pilocarpine on the salivary glands has led to its being tried lately in diphtheria, and with considerable success. It seems to fit naturally into and supplement the treatment of Oertel (F. 34a).

In the general treatment, an even temperature of 65° to 68° Fahr. is essential, with plenty of milk, ice, and cooling drinks, and with alcoholic stimulants if the powers are failing. The best internal remedy appears to be tincture of the perchloride of iron, given in large doses (30 minims every two hours in water or glycerine). Iodide of potassium and chlorate of potass have also been advocated. If the disease attacks the larynx and is advancing in severity, tracheotomy should be performed as soon as possible (F. 5, 7). Sir W. Jenner recommends, as a local application, a strong solution of nitrate of silver (1 drachm to 3i of water), and advises this to be used effectively, once and for all, around as well as over the patches.

For the secondary paralysis of diphtheria, tonics, change

of air, and careful electric stimulation by the constant current, are recommended.

HOOPING-COUGH

is an infectious disease, which usually occurs in childhood, and is preceded by a catarrh of from three to fourteen days' duration. Succeeding this there is a peculiar cough of a paroxysmal character, which is pathognomonic of the disease. Hooping-cough usually terminates in six weeks; at times it may be prolonged from two to three months. It is not attended with much danger *per se*, but it may, and often does, originate various chest diseases, notably emphysema.

When hooping-cough has fairly determined itself, it exhibits characteristic features. The child has usually some premonitions of an attack, and runs to its mother or nurse for protection. Then commences a paroxysm of expiratory efforts and cough, with no intervening inspiration. The child becomes black in the face, and it would appear as if suffocation were imminent, when a long-drawn inspiration takes place, attended with a peculiar crowing sound. This sound is doubtless due to the air entering the contracted, or even partially closed, rima glottidis. When expansion of the glottis has been completed, and the air is permitted to enter freely, the fit for the time is over. Or a succession of forcible expirations and cough alternate with crowing inspirations, until a quantity of mucus is brought up, or actual vomiting ensues.

The paroxysms, occurring in the twenty-four hours, vary as regards intensity. As a rule, they are worse at night. During the early stages of the disease the mucus expectorated is thick and sticky, but afterwards, with the decreasing intensity of the paroxysms, it becomes thinner, more abundant, and more easily brought up.

The stethoscope detects simply catarrhal sounds, or perhaps no abnormal breathing. The expiratory paroxysm may reveal wheezing, but during the long-drawn inspira-

tion no sound can be heard in the lungs at all. This may be partly explained by the slowness with which the air enters by the contracted glottis, and partly, as Laennec says, by "the spasmodic contraction of the muscular or contractile fibres of the bronchi not allowing the air to enter."

Etiology.—The absence of fever in hooping-cough negatives the idea that the disease is due to inflammation; and it has been urged, from its spasmodic character, that it is probably dependent on irritation of the pneumogastric nerve by some peculiar poison. Some consider that this poison affects the cervical glands, which lie in the course of this nerve or of the recurrent laryngeal, and causes these to enlarge, as in a similar manner the parotid gland is increased in mumps.

Fatal cases usually exhibit pulmonary collapse—the lobular pneumonia of former writers; and with this there is also evidence of bronchial inflammation.

Treatment.—The disease tends to run its course like all specific diseases, and the rule of practice appears to be best met by warding off complications and treating symptoms. Therefore, avoid all gastric irritation by keeping the patient on a regulated diet, with plenty of milk and little meat, and attend carefully to the bowels.

Various specifics have been recommended, one of the most noteworthy being that of Dr. Fuller (F. 15a), which is based on gradually-increasing doses of belladonna, and by the employment of which he states the hoop rarely lasts more than twenty-one, and may terminate in ten, days.

Nitric acid has been employed successfully by Dr. Gibb (F. 15). Bromide of potass (F. 70a), alone or in combination with hydrate of chloral (F. 70a) or carbonate of iron, has been highly spoken of; so also have inhalations of carbolic acid (F. 53a).

Hydrobromic acid, the result of the action of tartaric acid on the bromide of potassium, is said to have a very soothing effect on the disease, the dose for a child of three years being 8 to 10 minims. Fletcher's hydro-

bromic acid is now made up with syrup and has a pleasant taste. Dr. Harley recommends bromide of ammonium (in doses of 4 to 8 grs.) to children from eighteen months to three years, and his opinion is confirmed by others. The rapid action of apomorphia in relieving pulmonary and gastric embarrassments suggests a valuable future for it in this disease; and for internal use it can be kept safely in a permanent solution with simple syrup. Dilute hydrocyanic acid in late stages of the disease is an excellent remedy (F. 9, 13).

Locally, Roche's embrocation has considerable popularity among the poorer classes. If the child submits without coercion or great struggling, a solution of nitrate of silver, 2 grs. to 3i of water, may be applied to the fauces daily. Should there be great resistance on the child's part, the application of the remedy will do more harm than good.

If bronchitis sets in, poultices should be applied to the chest, probably after leeching, and the internal administration of antimonial or ipecac. wine. If requisite, these may be followed by stimulants.

Head Symptoms.—Squinting, convulsions, or stupor, must be met by small and repeated doses of hydrarg. c. cretâ, warm baths, etc.

Niemeyer says—"Hooping-cough can be cured on the principle that 'he who spareth the rod spoileth the child,' and that the cough of hooping-cough is not an exception to the physiological law, 'that violent reflex symptoms are controllable by the will.'" Hence he advises coercion, the promise of no bonbons or toys if coughing is persisted in, and states that the effects of this mental dietetic are admirable.

It is often asked whether patients should be allowed out in the open air. In all but acute stages this may be permitted with much benefit, especially in the warding off of succeeding tubercular disease.

CATARRH.

We have commenced, and, to a certain extent, illustrated in the preliminary remarks the effect a cold has upon the chest when it attacks the mucous membrane of the respiratory tract. It may, however, stop at the head, affecting only the nose (*coryza*) or the frontal sinuses (*gravedo*), giving rise at first to dryness, and afterwards to what is termed running at the eyes or nose, and a profuse muco-purulent discharge. The concomitant general symptoms vary from weariness and stuffiness of the head to actual headache and some distinct feverishness, with inability to attend to ordinary duties.

The aim in treatment is to endeavour to keep the catarrh at its place of origin. How are you to stop a cold? Catch it at its commencement, and treat it by an opiate. Twenty drops of tincture of opium, or ten drops of liq. morph. and eight of vin. antimon. given twice at an interval of three hours, will usually accomplish this. A simple and effective method has also been suggested—viz. to forbid the use of any kind of liquid for twenty-four or forty-eight hours. In this way the materials for flux are minimised, and it dies of inanition. A Turkish bath can also be recommended. Spirit of camphor sprinkled on a handkerchief and inhaled quickly checks the running at the eyes or nose, and may be repeated if it occurs. Quinine \times grains is also highly recommended as checking incipient catarrh. It may be given suspended in milk. For “chronic sneezing,” peculiar to some people in the early morning on leaving their bedrooms, or on entering a cold room, the same remedy can also be recommended, or the inhalation of bruised alum, 10 grs. to the \mathfrak{z} i of water. The iodised steam arising from 30 to 40 drops of tincture of iodine placed in two pints of boiling water may also be inhaled night and morning for five minutes.

LARYNGITIS, etc.

The extension of a common cold to the larynx, leading to congestion and slight inflammation of the mucous

membrane, is by no means uncommon. It is evidenced by hoarseness, soreness in drawing in the breath, and a dry tickling cough, and is attended with no danger. "Acute laryngitis" is a much more severe, and fortunately a rare affection. It is peculiar, generally speaking, to adults, and due usually to exposure to cold or wet, or to the inhalation of vapours or dust. Oedema of the glottis, culminating in "acute laryngitis," may be produced immediately by the fumes of irritating gases, and by the accidental swallowing of boiling water. In whatever way "acute laryngitis" originates, its symptoms are well marked. Thus, there is pain in the region of the larynx, notably at the pomum Adami, and this pain is increased by pressure externally, while internally there is a feeling of great dryness and soreness, and a sensation as if the passage was narrowed. The inspiration is protracted, wheezing, and laborious, the expiration comparatively easy, the voice hoarse or altogether lost, the cough peculiarly imperfect and brassy, and attended with hardly any expectoration. Accompanying these local symptoms of "acute laryngitis," chilliness and more or less fever are found to usher in the disease, except it is of traumatic origin. The face is full and flushed, if the disease advances unchecked, but becomes pale or livid, while the pulse is feeble and irregular; restlessness is intense and accompanied by a feeling of suffocation—which actually does take place unless relief is afforded—with drowsiness, delirium, and coma. The patient dies asphyxiated, and this, as the symptoms indicate, is due to the rima glottidis having become so swollen as to be reduced to a mere chink, while there is inflammatory effusion into the subjacent areolar tissues. If a laryngoscopic examination can be made, the mucous membrane of the larynx will be observed to be red and swollen, being most markedly so at the aryteno-epiglottidean folds or the false vocal cords, or at the epiglottis, where all view may be obstructed. The course of the disease is rapid, sometimes carrying off the patient in twelve hours, or at all events before the fifth day. At other times

recovery ensues ; or the affection may pass into *chronic laryngitis*.

Treatment.—In laryngitis due to and accompanying a common cold, and hence better termed “laryngeal catarrh,” it is essential that all talking or undue exercise of the voice should be prohibited ; that the patient should keep to his room, which should have a uniform temperature of 63° to 66° Fahr. ; that a mild diaphoretic mixture should be given (F. 31), and that the cough should be relieved by inhalations (F. 52), or by a spray solution of bromide of potassium or chloride of sodium, 20 grains to the ounce.

In “acute laryngitis,” properly so called, leeches should be applied directly to the larynx of adults or the manubrium sterni of children ; or hot water compresses may be employed, and covered with india-rubber cloth. Scarification of the swollen parts by a curved bistoury protected to within a quarter of an inch of the point has been followed by relief of the severe paroxysms. Should, however, marked stenosis occur, and the local means mentioned aided by inhalation (F. 31) fail to give relief, tracheotomy ought to be performed without delay ; and thus rest will be allowed to the inflamed part, and relief to the engorged lungs.

CHRONIC LARYNGITIS.

Chronic laryngitis may be defined as a low persistent inflammation of the mucous membrane and glandular structure of the larynx, occasionally confined to the glandular structure alone.

The SIMPLE form depends on a too early use of the voice after acute laryngitis, and it may also follow “over-feeding.” A peculiar variety called “follicular,” “glandular,” or “clergyman’s sore throat,” results from habitual exertion or straining of the voice, sometimes coupled with excessive use of alcohol and tobacco. SPECIFIC forms of chronic laryngitis are observed in syphilis and tubercular diseases.

Anatomical characters.—The mucous membrane is swollen and hyperæmic; the vessels are dilated, usually in patches; the vocal cords may be congested; but ulceration is rare in simple chronic laryngitis. In the variety called “clergyman’s sore throat” the racemose glands are hypertrophied at the base of the epiglottis and on parts of the ventricular bands, the surrounding vessels dilated, the ducts and cul-de-sacs enlarged, and their orifices closed, so that the secretions accumulate, and this accumulation may lead to ulceration. Usually the follicles of the pharynx are in a similar condition.

Symptoms.—The symptoms of chronic laryngitis are hoarseness, loss of voice (aphonia), a persistent dry cough, with little expectoration, a sense of dryness with slight pain in the throat, and occasionally after exertion dyspnoea.

Prognosis.—The disease may sometimes subside spontaneously, but usually it is obstinate, and only yields to well-directed treatment. Especially is this the case with the variety termed “clergyman’s sore throat.”

Treatment.—Absolute rest of the voice is essential. Errors of diet and hygiene must be corrected. The larynx should be brushed every other day with a strong solution of nitrate of silver, 40 grains to the ounce; medicated sprays should be used daily and a solution of tannic acid and alum, or steam of boiling water containing $\frac{3i}{v}$ of tincture of iodine, or 10 drops of pine oil dissolved in spirits, in the pint of water. In the obstinate cases inhalations of steam are attended with great benefit, especially in the glandular variety. Taking a pod of cubeb pepper or the local application of tannin and glycerine is also useful.

TUBERCULAR LARYNGITIS.

Synonym—Laryngeal Phthisis.

This depends upon tubercle, and may accompany or precede tubercle of the lungs. It frequently leads to ulceration of the soft parts, and to caries and necrosis of the larynx.

Anatomical characters.—Minute deposits of miliary tubercle are found in the mucous membrane, causing at first slight eminences, which become the seats of ulceration. By extension to deeper parts, fibrous tissue is involved; articulations suppurate, and cartilages are destroyed. The first cartilage attacked is the epiglottis, then the arytaenoid and the cricoid. Occasionally abscesses result.

Symptoms.—The symptoms are *local* and *general*.

LOCAL.—Hoarseness and weakness of the voice, cough tickling and laboured, difficulty of swallowing, expectoration at first scanty, becoming, if the lungs are also affected, profuse, and including portions of cartilage.

GENERAL.—To these local symptoms are added the waste and decline of pulmonary phthisis.

Diagnosis.—The early oedema and marked ulceration caused by the tubercles distinguish tubercular from chronic laryngitis. From syphilitic disease the diagnosis is more difficult; the history is the prominent diagnostic test, as the ulcers in both at the commencement of the disease appear to be similar.

Treatment.—If occurring alone tubercular laryngitis is incurable, but its rapidity may be checked. If it *precedes* tubercle of the lungs it may last for some years; if it *succeeds* pulmonary consumption its course is speedy and fatal.

The *GENERAL* treatment is similar to that of pulmonary consumption, having for a basis a residence in a warm equable climate, with the administration of cod-liver oil and the hypophosphites.

The *LOCAL* treatment consists in soothing gargles, easily swallowed food, application by brush of a powder containing nitrate of bismuth and $\frac{1}{8}$ grain of hydrochlorate of morphia. Inhalations of hops and conium are specially grateful (F. 52, 54). To promote the healing of ulcers mild solutions of glycerine and iron, nitrate of silver, or sulphate of copper may be tried.

SPASMODIC LARYNGITIS.

Synonym.—False Croup.

A mild degree of inflammation of the larynx attends the disease, and distinguishes it from "laryngismus stridulus," which is a nervous affection without inflammation. Mothers speak of this disease when they say "their children are liable to croup." It generally occurs in children from two to five or seven years of age, and occasionally accompanies the exanthematous diseases, especially measles.

Symptoms.—False croup is preceded by some signs of catarrh for a day or two, as evidenced by cough and hoarseness. The child affected is during the night suddenly seized with a suffocative feeling, and with a spasmodic cough and dyspnoea. A cooing sound attends the inspirations, and indicates spasmodic closure of the larynx.

Treatment.—There is little if any fever, and the attack usually yields to warm poultices and flannel cloths wrung out of hot water and applied to the throat, with an emetic dose of vin. ipecacuanhæ (F. 4).

CEDEMATOUS LARYNGITIS.

Synonym.—Edema Glottidis.

This disease indicates inflammatory exudation into the submucous areolar tissue of the larynx of serous, seropurulent, or sero-gelatinous fluid. The exudation attacks first the epiglottis, and may extend to the ventricles and other parts of the larynx, but it rarely implicates the vocal cords.

Edema may occur in the course of acute laryngitis, or it may supervene on chronic laryngitis. It may complicate exanthematous affections, or follow on scalds from drinking boiling fluids. It occurs also sometimes in Bright's disease not as passive dropsy, but as the result of inflammation.

Symptoms.—The swelling causes difficulty of swallow-

ing and dyspnoea. By the laryngoscope the epiglottis is seen rounded and swollen like a chestnut, or its two sides are distended, so as to resemble two mucous bladders pressed together in the middle line.

Treatment.—The treatment is indicated under acute laryngitis.

THE LARYNX may also be the seat of lupus occurring with the same disease of the skin; malignant disease may spread also from the oesophagus, pharynx, and other parts, but rarely occurs primarily. Growths of various kinds may attack the larynx, as (a) papilloma, (b) fibroma, (c) sarcoma, (d) adenoma, (e) myxoma or mucous polypus, (f) cystic polypus, (g) epithelioma.

Symptoms of Polypus.—The growth is at first harmless, and may attract little attention until it attains some size, when difficulty of breathing sets in. The most common symptom is modification of the voice, with a dry, croupy, and spasmodic cough. The tumour is recognised by the laryngoscope, and as it rarely disappears spontaneously it is necessary to operate upon it.

Treatment.—If attacked by the mouth the tumour may be torn off by forceps, or cut by knives, or crushed by an ecraseur. When the growth is very large, thyrotomy (division of both thyroid and cricoid) may be necessary, and through the artificial opening the growth or growths may be removed.

The late Dr. Foulis of Glasgow successfully removed the larynx for recurrent sarcoma.

FALSE CROUP.

Non-inflammatory croup, to which also the names of "laryngismus stridulus," "spasm of the glottis," "spasmodic croup," and "spurious croup," have been applied, is met chiefly in scrofulous, rickety children of one or two years of age. It may originate from the brain, as in hydrocephalus; from direct irritation of the vagus or recurrent laryngeal nerves; from tumours or enlarged thymus gland; from reflex causes, such as dentition,

worms, improper feeding; or from mental emotion, fright, or anger.

Symptoms.—The attack is sudden, usually occurring at night and during sleep, and is characterised by one prominent symptom, dyspnoea. No air enters the glottis for the moment, and respiration seems to cease. The child struggles for breath, as if it were about to die from suffocation. There may be also convulsions and a contracted state of the flexor muscles of the thumb, fingers, and toes (carpo-pedal spasms).

The paroxysm ceases suddenly, but may be succeeded by others, and death sometimes takes place through suspended respiration, or by the stagnation of the blood in the lungs, heart, or brain. The train may be laid for serious after-results, and although termed false croup, the disease is not free from peril.

IT IS CHIEFLY DISTINGUISHED FROM TRUE CROUP BY ITS SUDDEN ACCESSION AND SUDDEN DEPARTURE, BY THE FREEDOM OF BREATHING BETWEEN THE PAROXYSMS, AND BY THE ABSENCE OF FEVER, HOARSENESS, AND ANY ATTENDING COUGH OR INFLAMMATION.

Treatment.—During the paroxysm place the child in a warm bath, apply a hot sponge to the throat, and, after the infant is taken from the bath, or before it, sprinkle the face and chest with cold water. The cold sprinkling arrests the paroxysm for the time; and to avert the recurrence of convulsions, should these be present, bromide of potassium should be given combined with syrup of chloral.

As further prophylactic remedies regulate the bowels, lance the gums if hot and tender, and recommend fresh air and nutritious diet.

As the disease frequently depends on a rickety state of the system, 5 to 10 grains of the phosphate of lime may be given thrice daily in chalk mixture.

SYPHILITIC DISEASES OF THE LARYNX.

In advanced stages of syphilis the larynx may be

seriously affected, and may then be the seat of tubercles or of ulceration, following upon a syphilitic eruption or gummata.

Symptoms.—The disease is attended with loss of voice, hoarseness, and little pain, fever, or dyspnoea.

Prognosis.—The prognosis is generally favourable, as the laryngeal affection yields to appropriate syphilitic treatment. If left to itself in tertiary syphilis, it may destroy life.

Treatment.—The treatment is indicated under syphilis. The best way of using mercury being inunction or the injection of the perchloride (see page 85). Iodine inhalations should be employed. The ulcers may be touched with strong solutions of nitrate of silver, or, if isolated, by the solid stick.

1. **NEUROSES OF LARYNX**—Sensory Neuroses.—*Hyperæsthesia* of the laryngeal mucous membrane may accompany acute or chronic inflammation, or it may be a hysterical symptom.

Anæsthesia occurs as a sequel of diphtheria, or when the superior laryngeal nerve or its centres are affected. It is usually associated with paralysis of the muscles of deglutition, and of the depressors of the epiglottis, and leads to food passing into the larynx deprived of its reflex sensibility.

2. **PARALYSIS OF THE LARYNX.**—Loss of power in the laryngeal muscles depends on various causes. Thus paralysis of the superior laryngeal nerve, supplying the crico-thyroid muscle, in addition to the anæsthetic symptoms previously mentioned, prevents due tension of the vocal cords, and establishes loss of voice.

Complete paralysis of the muscles supplied by both recurrent laryngeals, the motor nerves of the larynx, causes the vocal cords to become fixed and immovable; but disease or pressure on one of these nerves paralyzes only certain groups or individual muscles.

Perhaps the most common lesion is paralysis of the **ABDUCTORS** (posterior crico-arytænoids, etc.), causing the

vocal cords to near each other in the middle line, in a relaxed state. This serious state of matters during respiration leaves only a narrow space, causing very harsh breathing, and probably asphyxia.

Paralysis of the ADDUCTORS when one or both cords are seen at all times relaxed and drawn aside, leads in the latter case to complete want of voice, and in the former to aphonia more or less pronounced, but is not necessarily accompanied by much difficulty of breathing. When these conditions remain long the muscles become atrophied.

These varieties of paralysis are recognised by the laryngoscope, and familiarity with this instrument is essential for pronouncing a diagnosis on laryngeal paralysis.

Treatment.—The pressure of an aneurysm or enlarged cervical or bronchial glands or other tumours on the nerve trunks renders treatment of little avail. It may be necessary to perform tracheotomy to avert for a time asphyxia. Electricity, from the nature of the case, in many instances could be of little use, if the cause is rightly apprehended, and reported cures are probably those of feigned, not real, disease.

BRONCHITIS

is essentially an inflammatory affection of the bronchial mucous membrane, and may be either acute or chronic.

It is caused by exposure to cold or wet, local irritation from mechanical operations, *e.g.* needle-grinding, or it may be dependent on heart disease, or associated with various constitutional affections, such as rheumatism, gout, fever, Bright's disease. It is most common in childhood and old age.

Two varieties of acute bronchitis have been recognised :

1. When the larger and medium-sized air-tubes are alone affected.

2. When the inflammation does not stop there, but involves all the bronchial ramifications—capillary or general bronchitis.

The last form is rarely seen in adults, but chiefly among young children and old people, and is frequently fatal.

Certain general symptoms accompany both varieties. Thus, there are chilliness, fever, running at the eyes and nose, and general malaise. The extension of the inflammation down the respiratory tract causes irritation of the mucous membrane of the larynx and trachea, which is evidenced by a sense of tightness behind the sternum, and a tickling sensation about the windpipe. The expectoration is at first dry, and difficult to bring up, scanty, white, and frothy; but in the course of a few days, or a few hours, it increases in quantity; and if the attack be severe or prolonged, it becomes muco-purulent.

In the more severe form the symptoms, corresponding to the gravity of the case, are more urgent. The restlessness is great, the fever high, anxiety is depicted on the countenance, and the impaired and impeded circulation through the right side of the heart is evidenced by the livid lips; and this lividity sometimes extends over the body, and is observed at the finger ends. Should the disease terminate favourably, there is a gradual remission in the severity of the symptoms. The fever decreases. Respiration becomes easier, the cough less troublesome, and the expectoration freer. But if a fatal termination is likely, the symptoms increase in intensity. Unable to sit up in bed, the patient sinks exhausted on the pillow. The breathing is thus more difficult, and the lividity becomes more intense. There is not the power to bring up the mucus, which accumulates in the air-passages, and thus the patient dies from suffocation, or apnoea, due to the arrest of the circulation through the lungs in consequence of the coagulation of blood in the pulmonary arteries, and in the right cavities of the heart.

On auscultation during the first or dry stage of bronchitis we detect two coarse, rough, dry sounds all over the chest. The air-tubes are narrowed, but the air does not come through mucus; hence the dryness of the sounds, which are termed sonorous rhonchi if the larger

tubes are implicated, sibilant rhonchi if the smaller ones are involved. Percussion in this stage is clear.

When the secretion of mucus commences, these dry sounds are replaced by large bubbling in the larger air-tubes, or small bubbling if the disease has reached the smaller tubes. This has been termed the moist stage of bronchitis, and the sounds then heard have been technically called large and small crepitations.

Percussion may now sometimes detect dulness through oedema at the base of either lung; while, if there is pulmonary collapse through tenacious mucus plugging up a bronchial tube, as not unfrequently happens, the percussion note will lack resonance over that particular part.

Prognosis.—From one-half to three-fourths of those attacked with capillary bronchitis die between the sixth and tenth days of the disease. In favourable cases improvement commences from the fourth to the eighth day. Bronchitis affecting the larger air-tubes is not dangerous. Relief generally supervenes when expectoration becomes abundant. Should this fail to return, pulmonary congestion ensues, and ultimately death. Circumstances increasing the gravity of the prognosis are very early or advanced life, the existence of some acute or chronic disease, or other complications.

Anatomical Appearances.—The morbid appearances directly indicating bronchitis as a distinct affection may be summed up in one word—redness, which may, however, vary in intensity. With the redness there is swelling, and at first dryness, of the mucous membrane. The dryness is afterwards replaced by a muco-purulent secretion.

Treatment.—Every case of bronchitis must be treated individually, as no general rule can be laid down. Yet it may be stated that bronchitis, during its early catarrhal stage, may sometimes be prevented from proceeding farther by the administration of a full dose of opium in wine or whey. If the fever is too intense for this, a hot bath, followed by a weak saline purgative, diaphoretics and expectorants, must be trusted to (F. 45); or anti-

monial wine, with Liq. ammon. acet., for children, in doses proportioned to their years, or (F. 34).¹

Bronchitis occurring in people of a gouty habit must be met by adding colchicum to the above-mentioned formula. The antimonial mixture may be omitted when the expectoration becomes freer. Steam or medicated inhalations are very grateful. When the depression is extreme, and the lividity great, carbonate of ammonia must be trusted to.

Local applications will consist of sinapisms, turpentine stupes, jacket poultices of linseed meal, etc. The diet should be fluid,—milk, beef-tea, gruel, arrowroot, in ordinary cases; and to these wine or brandy must be added in the more severe types of the disease.

Stimulants are specially necessary in the capillary bronchitis of young and old people. The general rules for their employment are indicated at page 33.

In sthenic cases occurring in adults, cupping, or the application of a few leeches to the chest, has been strongly recommended. General blood-letting has now been practically abandoned.

CHRONIC BRONCHITIS

sometimes follows the acute form, or is the result of general bad health, or the sequela of what are termed coughs and colds. It is common in advanced life, appearing in wintry inclement weather, and disappearing in summer. It may vary in its severity, at times being attended with little or no uneasiness except a slight cough and some expectoration; in other cases the cough is very harassing, especially in the morning, the expectoration copious and resembling very much the nummular sputa of phthisis, or it may simply be frothy and muco-purulent. Fresh exposure to cold or atmospheric changes may at any time convert chronic into a dangerous form of acute bronchitis.

¹ The antimonial mixture is more fully mentioned under the treatment for Pneumonia, page 198.

Chronic bronchitis is sometimes dependent on certain constitutional diseases, as syphilis, gout, rheumatism. It also specially affects workers at certain occupations; *e.g.* knife-grinders, miners, cotton operatives, etc. Auscultation after free expectoration reveals loud harsh sounds all over the chest. These are best described as snoring. They vary in their intensity according as the air-passages are well cleared from mucus, or the reverse. In advanced cases the respiration is of a hollow blowing character, and attended with gurgling. Percussion is unaltered unless there is great accumulation of matter to be expectorated, when it may be temporarily dull over a particular spot.

BRONCHIECTASIS.

Sometimes, as the result of various chronic lung affections—as bronchitis, emphysema, or interstitial pneumonia—a bronchial tube may become so dilated as to form a single pouch, like an aneurysm of an artery, or a series of pouches in the same tube. This condition is termed Bronchiectasis, and if the cavity is near the surface, is surrounded by condensed lung, and contains air as well as liquid, the signs will be identical with those of a phthisical cavity, and can only be distinguished from it by the fact that such dilatations are usually found at the middle and lower parts and not at the apices of the lung; by the absence of lung tissue in the expectoration, which is abundant and foetid, and by the breath being very offensive.

PLASTIC BRONCHITIS.

A peculiar form of bronchitis, occurring either in an acute or chronic form, but much more frequently in the latter, is called variously “croupous,” “plastic,” or “fibrinous.” It is very rare, occurs more frequently in males than in females, between the tenth and the thirtieth years of life. It is attended with the ordinary symptoms of bronchitis, and has only one certain diagnostic sign, THE EXPECTORATION OF BRANCHING BRONCHIAL CASTS.

Recovery in the chronic form is the rule, although the disease is apt to recur.

Treatment.—Indications for treatment vary according to the different forms of Chronic Bronchitis, but, in all cases, are based on certain obvious principles. The patient should always be well clad, flannel being constantly worn, and he should be exposed as little as possible to the vicissitudes of the weather. During winter, if circumstances admit, the patient should reside where the climate is mild and dry. In addition, an attempt must be made to relieve the cough, to promote or restrain free expectoration, and subdue spasm. As stimulating expectorants, Vin. ipecac., Squills, and Senega, may be mentioned, or (F. 43, 44, 46). German authorities state that Hydrochlorate of ammonia is specially useful in inducing perspiration and causing an increased flow of urine. Further, it relieves the dyspnoea and liquefies the expectoration. About 45 grains should be given in twenty-four hours; a convenient method being 6 grains every three hours in a wine-glassful of water. The addition of 10 minims of Sp. chloroformi and 30 of Syrup renders it palatable. In checking the expectoration when excessive, Tincture of benzoin, Dilute Sulphuric Acid, and the various preparations of Opium, may be employed (F. 21). Inhalations of steam alone, or charged with hops or with dilute hydrocyanic acid, are serviceable for the cough or spasm (F. 53, 53a, 54). The treatment for bronchiectasis can only be palliative (F. 44, 45, 51, 52). Yet oil of turpentine has been highly recommended as actually producing a cure, in doses of m. xx. In "fibrinous bronchitis" emetics are indicated after hot inhalations, to remove the branching casts in the bronchi. Iodide of potassium is also specially serviceable for this, as the casts are said to become loose even on the second day of its administration. There is no remedy as yet known which will prevent its recurrence.

ASTHMA

seems to be essentially a spasmodic disease, the patient being healthy in the intervals, although during the paroxysm, which seldom proves fatal, suffocation seems imminent.

Symptoms.—The first invasion takes place during sleep. The patient awakens to find that he can scarcely get breath hence he puts himself into the position that gives him most purchase for breathing. Respiration is accompanied by great wheezing, and yet, hardly any respiratory murmur is heard. The patient feels that, if he could cough and expectorate, he would be relieved, but this he cannot do till the end of the paroxysm. The extremities are cold, the face livid, and the expression anxious. Pulse small and quick, but no fever. Towards the end of the paroxysm the expectoration appears, and is found to consist of frothy mucus free from blood or pus.

Such patients are usually thin and round-shouldered, and the attacks often appear to take on a periodic character. Asthma is most frequent during middle life, affecting men more than women, and being often hereditary.

Asthma is termed *idiopathic* or *spasmodic* when uncomplicated, and *symptomatic* or *organic* if it accompanies bronchitis, heart disease, etc.

Causes.—*Direct.*—As irritating inhalations, or over-eating. The latter leads to distension of the stomach and pressure on the diaphragm.

Indirect.—Through the nervous system, as by strong emotions.

Prognosis.—In itself most favourable, but by its complications, as congestion of lungs, emphysema, and hypertrophy of heart, it is of much more serious import.

Pathology.—Asthma consists essentially of a spasmodic contraction of the muscular fibres of the bronchial tubes, by which means the admission of air is diminished, and the tubes become blocked up with expectoration, which it is partly the function of the muscular fibres to expel.

Treatment.—In the treatment of asthma, various remedies have been recommended, and, even in employing those specially useful, it is advisable at times to change the treatment, for they seem sometimes when continued to lose their efficacy. Iodide of potassium in gr. v. doses thrice daily is a favourite drug either alone or combined with tinct. scillæ m. x., tinct. lobeliæ m. xv., liq. morphiæ hydrochloratis m. xii.; occasionally very large doses of the iodide are given to the extent even of gr. xxx. to gr. xl. daily. Niemeyer favours quinine if the seizures are regular and frequent; if irregular, and at long intervals, he prefers treatment by metallic nervine remedies to tinctures. Of these may be mentioned, as specially entitled to confidence, saccharated carbonate of iron, oxide of zinc, and arsenious acid; or in bad cases nitrate of silver. During the paroxysm stramonium cigarettes may be smoked. Strong coffee without milk or sugar may be taken, or inhalations of chloroform, or ether, or iodide of ethyl may be tried. Five drops of nitrite of amyl sprinkled on a handkerchief and inhaled sometimes cut short a paroxysm. Pulv. nitratis potassæ ℥ss., pulv. stramonii ℥ss., pulv. lobeliæ ℥ss., and black tea ℥ii., should be carefully bruised together; a teaspoonful of which burnt on a plate emits pleasant fumes which frequently act beneficially. Injections of pilocarpine are highly recommended in asthma with profuse expectoration (humid asthma), or for the same form of asthma, R̄ tinct. sanguinaris ℥i., tinct. lobeliæ ℥i., ammonii iodidi ℥i., syr. tolutani ℥vi. M.—a teaspoonful dose.

The fact that asthmatics are frequently benefited by fog and murky conditions of the atmosphere, which aggravate other bronchial affections, suggests specially in this disease a change of air. Thus if the asthmatic patient usually lives in the town he may try the country, or *vice versa*. Personally I have seen asthmatics during Glasgow fogs in frosty weather enjoy exceptional health, and when the winter was open and free from frost they, on the other hand, suffered intensely.

HAY ASTHMA, OR HAY FEVER.

This is a peculiar affection distinguished by a catarrh of the eyes, nose, mouth, pharynx and larynx, with dyspnoea, and dependent on the inhalation of the pollen of various plants, chiefly of the graminaceæ prevalent during the hay season. The severity of the disease varies.

Hay fever is common in England, perhaps more so than in any other country, but it is also observed all over Europe, and even in warm climates, as Ceylon and India.

Symptoms.—The first symptom is itching of the nose, hard palate and fauces, and eyes, which is followed by violent fits of sneezing and running from the eyes and nose. The submucous tissue of the nares subsequently swells, and the nostrils become blocked up—the discharge from them ceasing. Slight feverishness is also present, the pulse rate being increased to 110°.

With the catarrhal symptoms there are sometimes considerable asthma revealed by tightness of the chest, difficulty of breathing, wheezing, prolonged expiration, followed at the end of the attack by expectoration.

As a rule the liability to the attacks lasts from three to four weeks in summer. There are no complications, and the fever passes away with the departure of the exciting cause.

Hay fever occurring only in summer is distinguished from “cold in the head” and from asthma by the catarrh, which is usually unknown in ordinary asthma.

Treatment.—Removal from the exciting cause is essential. Hay fields and country walks should be avoided during the summer months, and a change of residence made to the sea-side, where the prevailing winds are from the sea, not from the land.

The best remedies are quinine (F. 75) and arsenic (F. 4). A spray may be used to the nostrils, containing solutions of carbolic acid (8 grains to the ounce), or sulphate of quinine (2 grains with acid to an ounce of water), or tannic acid (4 grains to the ounce).

Latterly hydrochlorate of cocaine tablets ($1\frac{1}{4}$ grains) inserted into the nostrils have been highly recommended on the testimony of sufferers from the disease.

PNEUMONIA.

Acute inflammation of the substance of the lung is best recognised, probably, from its clinical history.

A person catches cold, as the saying is. The cold settles in his chest. There is also feverishness, preceded by shivering, and accompanied by gastric disorder, and sometimes by jaundice. Then the breathing becomes accelerated, although not laborious, and there is a cough, this cough causing pain, which is referred to the chest, and, as a rule, to that particular part of it which is affected. After a varying interval, the cough, which at first was hard, becomes softer, and a tough tenacious sputum is expectorated. This sputum is considered, and justly considered, characteristic of the disease. It is thick, adherent, glairy, sticking to the sides of the vessel, and through part of it a prune-juice colour is observed; or what is more often termed the "rusty sputum of pneumonia," which a student of mine once likened to badly-mixed Gregory's powder. The temperature, in accordance with the fever, is necessarily increased, and it may reach 105° F.; or there may be typhoid symptoms, with debility, dry tongue, or delirium—so much so that the affection may be mistaken for typhus fever. The pulse is frequent, and hard at first. A herpetic eruption frequently appears on the lips or nostrils about the acme of the fever.¹ Such are the general outward signs of pneumonia. What is going on inside? In answer to this it may be stated that the disease has been divided into three stages, which it is well to be familiar with, although it is absurd to suppose that they follow one another with mathematical precision. In the **FIRST STAGE**, if an opportunity was afforded of examining the organ attacked with inflamma-

¹ This herpetic eruption is in my experience always a favourable sign. Nurses term it the "breaking out of the cold."

tion, the characteristic appearance of the part involved would be redness, with a quantity of red frothy serum escaping on section. The elasticity and sponginess of the lung are diminished, but it still will float in water. The vesicles contain fluid and air, and fine crepitation is heard by the stethoscope. In the SECOND STAGE the redness has yielded to solidification. The part affected has a thick heavy consistence. It no longer crepitates when pressed, and if thrown into water it sinks. Pressed between finger and thumb it breaks down, and from the appearance being like that of liver tissue it has been termed "red hepatisation." Here the fluid in the vesicles has coagulated. In the THIRD STAGE resolution is taking place in the majority of cases, and the lung is coming back to its primary condition. When cut into, a great quantity of reddish or grayish fluid oozes out. Hence some call this "gray hepatisation." This stage may, however, be carried farther into diffuse suppuration, and sometimes, though rarely, into "abscess" and "gangrene."

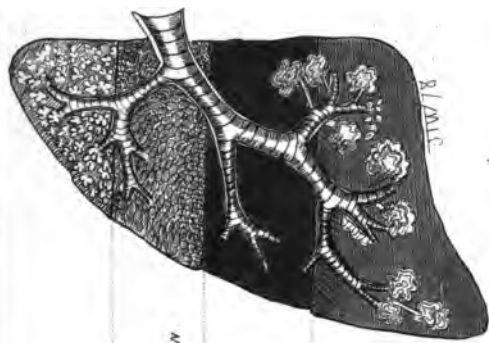
The change from the first to the second stage goes on rapidly, twenty-four hours or even less being sufficient. It must also be remembered that you may have one part of the lung in the first, another in the second, and another in the third stage, so that the auscultatory phenomena, which come now to be considered, will be found to vary at different sites. The accompanying engraving is intended to show the three different stages of pneumonia, while the upper part is unattacked by inflammation. On applying the stethoscope over an inflamed lung, the healthy vesicular sound may in part be heard, with the addition of minute crepitation during inspiration. What is this due to? Very probably it is formed in the minute spaces of the bronchial terminations and pulmonary vesicles; and by some is considered due to the bubbling of air through the liquid in the vesicles, and by others to the forcible separation of the walls of the vesicles glued together by exudation, and yielding to the inspired air; the sound is best realised by rubbing a lock of hair in the immediate vicinity of the ear or throwing salt on a fire.

PNEUMONIA. Normal Lung.

1ST STAGE: ENGOERGEMENT.
CREPITATION HEARD ON INSPIRATION

2ND STAGE: COMPLETE DULNESS.
TUBULAR BREATHING.

3RD STAGE: RESOLUTION.
CREPITATION HEARD ON
INSPIRATION AND EXPIRATION.



In the second stage, over the part where the lung has become dense and solid, neither the vesicular murmurs nor the minute crepitation are heard, but there are other sounds probably—viz. bronchial respiration or tubular breathing. This is due to the fact that there is entering the condensed mass a permeable bronchus, and the sound is conveyed along the solid conducting medium. So, also, there may be no bronchial respiration, and no breath-sounds at all heard, because the bronchi may be filled up with accumulated secretion. Sometimes this may be set free by a cough, and the bronchial respiration may be established. Ask the person to speak while the stethoscope is applied over the site of the solidified lung, and the voice sounds will be conducted to the ear in an intensified manner, and hence the name "bronchophony." Similarly the vocal fremitus will be increased. On percussing the same part, it can also be easily understood how distinct dulness will be elicited.

In the third stage moist sounds are detected, for the lung is permitting the air again to enter. It is the first stage on a larger and coarser scale, because the crepitations are heard both during inspiration and expiration. It has been termed the *crepitatio redux*, and it is usually a happy sign in pneumonia, since it indicates that the lung is returning to its duty, permitting the air to re-enter its wonted seat. It does not come on at once, neither does it invade the whole lung at once; and at last, as health is established, it is replaced by the healthy vesicular murmur, if resolution has been thoroughly progressing.

In pneumonia the right lung is more frequently attacked than the left, and the site of the inflammation is usually at the base; hence the back and not the front is the proper place for hearing the phenomena indicated. Pneumonia is sometimes double. If it is not, the healthy lung, requiring to act with increased force, renders the respiration "puerile." The urine in pneumonia during the stage of hepatisation shows a marked diminution of chlorides. These reappear as the inflammation subsides.

It is frequently scanty, high-coloured, and tends to deposit urates. The average duration of the disease in uncomplicated cases is fourteen days ; when complicated, about twenty-one.

GANGRENE.—Should the inflammation end in gangrene, there will be an intense foetid smell of the breath, great prostration, dyspnoea, and hectic fever ; and a fatal result unless the part involved is very small. Gangrene may also result from obstruction of vessels, from embolism, various septic poisons, and (it is also said) from nervous influences.

A certain amount of bronchitis must always accompany acute pneumonia (broncho-pneumonia) ; very often also pleurisy, when the disease is termed pleuro-pneumonia.

CATARRHAL PNEUMONIA.

It is necessary to mention two other varieties of pneumonia, "catarrhal" and "interstitial." Catarrhal pneumonia, by some termed "lobular pneumonia," to distinguish it from the preceding form, denominated "lobar" or "croupous," has a clinical history and post-mortem appearances of a different character, the consolidation in "lobar pneumonia" being massive, in "catarrhal" or "lobular," disseminated, limited to single lobules, and scattered more or less over the lung-substance in patches varying in size from a hemp-seed to an egg. Catarrhal pneumonia is always associated with, generally preceded by, inflammation of the smaller bronchi (capillary bronchitis), and is a frequent complication of measles and whooping-cough, or it may follow a common cold in old or weakly persons. It may thus be considered a secondary morbid process, never originating primarily. Understood as such, what occurs in the lungs is this :—The inflammation may creep from the smaller bronchi to the air-vesicles, or it may follow pulmonary collapse, as it does in the great majority of cases. For, a bronchial tube becomes obstructed, collapse of the air-vesicles beyond the obstruction takes place, and subsequently in these vesicles

congestion and increased cell-formation ensue. The cells multiplying completely fill the alveolar cavity, and may, as the inflammatory process advances, undergo fatty degeneration, so as in appearance to change from a reddish-gray to a yellowish-white colour. This fatty change may lead to resolution and absorption, but frequently it is not completed, and the masses become cheesy, break down, and play an important part in pulmonary phthisis.

On section, therefore, of lungs in a recent catarrhal pneumonia, it will be understood how that the most prominent features will be pneumonic lobules scattered through its substance, as reddish-gray ill-defined nodules. Auscultation during life will thus reveal simply the sounds of capillary bronchitis, and percussion will indicate no dulness, unless the centres of inflammation have joined together over a considerable extent of the lung-substance, when areas of dulness will then be here and there detected. Its distinguishing characteristics from the first variety (lobar pneumonia), in addition to what has been mentioned, are its high temperature, its affecting both lungs, the absence of a distinct chill and of rusty expectoration; and finally, the mortality from it being usually much higher, as from one-half to two-thirds of those attacked.

INTERSTITIAL OR FIBROID CIRRHOSIS.

"Interstitial pneumonia," "cirrhosis of the lung," by some called "fibroid pneumonia," is rarely a primary affection, but is dependent on previous inflammation. The connective tissue of the lung becomes increased and hardened, the calibre of the air-cells is diminished and replaced by the fibroid growth. This change may follow on an unresolved pneumonia of the lobar form previously mentioned, or it may attend chronic phthisis or bronchitis. A lung which is the seat of fully developed "interstitial pneumonia" is diminished in size, solid, and hard to the touch, and when cut, it presents a smooth

shining appearance, and gives a creaking sound under the knife. By some, the change is considered identical with what occurs in cirrhosis of the liver or kidney, and has hence been termed "cirrhosis of the lung."

Prognosis.—Lobar pneumonia occurring in the young or very old is attended with great danger. An unfavourable prognosis must also be given when it is double, when the temperature is above 104° F., and when the patient has been addicted to drinking habits, and becomes delirious in the course of the disease. Although the pneumonia, *per se*, may terminate favourably, yet through its not resolving properly, or other circumstances, phthisis may supervene. In "acute catarrhal pneumonia," the prognosis depends entirely on the circumstances attending the development; when it occurs with measles or whooping-cough, the prognosis is favourable. But with scarlatina and a temperature above 105° F. it is very unfavourable, especially if there are also a feeble pulse and a tendency to coma. In "interstitial pneumonia" the prognosis as to time is good, as people with it may live for many years, and suffer only from dyspnoea. Any intercurrent affection will, however, have a direct influence on the prognosis of a disease which can scarcely be regarded as an independent affection.

Treatment.—Active treatment has been recommended in the early stage of pneumonia with the hope of making the disease "abort." Blood-letting from the arm with no sparing hand has still its advocates, and there is little doubt when the patient is young and plethoric it is a potent and successful means of treatment.

However, it is observed that patients with pneumonia often die from exhaustion, and blood-letting has been generally modified to the application of cups to the chest, followed by poultices and fomentations. If the blood-letting failed to cut the disease short, it would weaken the patient in the after-struggle of consolidation and resolution. Other remedies have been favourably spoken of as accomplishing the desired "abortion" of pneumonia. Thus fluid extract of ergot has been given every two hours.

Strong advocates are also found for tincture of aconite in 1 m. dose every hour for twenty-four hours and then less frequently. This remedy must be begun early, for it has no effect for good in the consolidation stage.

Quinine, in one large dose, gr. xxx. to gr. xl., or the same quantities divided into three doses and taken every two or three hours during the first day, has considerable evidence in its favour. It is stated that if it does not succeed in cutting the disease short it modifies the severity of the after-symptoms.

Tincture of belladonna, in doses of m. xv. every hour or two until its physiological action on the eye and throat is observed, has some supporters.

Sulphate of Morphia gr. $\frac{3}{4}$ or gr. $\frac{1}{2}$,
Sulphate of Quinine gr. vi.,

have been recommended in the first twenty-four hours. The result is to bring on perspiration, when the morphia may be stopped but the quinine continued in gr. v. to gr. x. doses every two or three hours until gr. xxx. to gr. lx. have been taken. If consolidation has commenced the morphia is omitted but quinine in the same dose as previously mentioned is prescribed alone.

Salicylic acid, in gr. xx. every two hours until four or five doses are taken, is stated by some American writers to promote free diaphoresis and resolution.

The treatment which I have found most benefit from will now be mentioned, with the proviso that all treatment must be regulated by the stage in which the pneumonia, if croupous, is observed. In the first stage one of the "abortive" remedies, preferably I should say quinine or modified blood-letting, might be tried. If only seen in the stage of resolution, when returning crepitation is heard over the greater part of the affected lung, it may be safely inferred that nature, aided by tonics or assisted by an occasional expectorant, will complete the recovery. On the other hand, when seen early, when the skin is hot, the pain severe, the dyspnoea intense, and when the face is flushed and anxious, there can be no

doubt that the application of twelve leeches to the affected side, followed by the internal use of antimony, is attended with marked benefit. Antimony is a cardiac sedative, and at the same time it lowers the respirations. So acting in diminishing the force and the frequency of the heart's pulsations and the intensity of the work thrown on the lung, it places the organ, as the surgeon sets the fractured limb, in a condition of comparative rest. It is not necessary to push the drug on the heroic principles advocated by Rasori, for it will be found that if given in $\frac{1}{8}$ of a grain doses as in 25 to 30 drop doses of vinum antimoniale every two hours, its purpose will be effected. Thus I give

R. Vin. Antimon. ʒss.

Sp. Chloroformi ʒiii.

Aquæ Camphoræ ʒv.

A tablespoonful every two hours. In the course of twenty-four to forty-eight hours the pulse will be diminished in volume, the temperature decreased, the skin bathed in perspiration, and the expectoration freer. The same mixture is continued for the next two or three days, but instead of every two hours it is taken every four hours. Then with returning resolution it may be stopped, for its object has been accomplished, and ammonia and bark may be substituted. If the plethoric symptoms are not so manifest, and if the case is only seen in the stage of consolidation, I still advocate the antimonial treatment, but without the leeches. The advisability of giving stimulants must be judged of by the individual peculiarities of the case. If the patient is a broken-down and dissipated man, or has been accustomed to take them freely, the necessity for their administration is indicated from the first. In other cases common sense and prudence must guide the practitioner.

Locally, hot linseed-meal poultices ought to be applied and carefully attended to. The temperature of the room should be kept uniformly at 60° Fahr., and milk and

beef-tea, given at regular intervals, should form an essential part of the dietary. The treatment is based on a clinical experience of eight years, during which time upwards of 200 cases were under the writer's care. Unfortunately, owing to the statistics having been burnt, the mortality can only be given approximately as having been from 6 to 7 per cent. Many clinical students, however, during those years, now practitioners, will be able to corroborate the statements made.

The general treatment of pneumonia, if the abortive method cannot be exercised, may be said in many physicians' hands to be in the main expectant, sustaining the patient's strength until the disease leaves him. This is supplemented in some cases by a cold bath, if hyperpyrexia is high, or wet packings if it is not, with gr. xv. to gr. xx. of quinine in the evening; if pleuritic pain, ice-bags to the chest; and Dover's powder, gr. viii. to gr. x. if there is restlessness; and vin. ipecac. if there is difficulty of expectoration.

Cool baths have found considerable favour in Germany, and are employed if the temperature rises above 104° F. The patient is placed in a bath of 70° F., and kept in it from seven to twenty-five minutes, if necessary the temperature may be lowered to 45° F., or ice-bags may be applied to the spine, and the surface of the body cooled by sponging with cold water.

Digitalis does not seem to lower the circulation or diminish the temperature in pneumonia.

Considerable benefit is observed from carbon. ammon. gr. iv., spiritus chloroformi m. x., aq. camphoræ 3x., every three or four hours, with or without alcoholic stimulants.

Ol. terebinthinæ has also been recommended as a stimulant in exhaustion, and infusion of *serpentaria* or *senega* in 3ss. doses every two hours in convalescence when the secretion is excessive.

In catarrhal pneumonia occurring in the progress of measles or other affections of children, Juergensen recommends a uniform moist atmosphere by means of steam so contrived as to pass over the mouth of the patient, and

in addition, baths of 77° to 86° Fahr., followed by cold affusion if the fever is high, and carbonic acid poisoning, from non-expansion of the lungs, manifest. Still further to dislodge the bronchial secretion, a mixture of oil of aniseed, senega, and ammonia is advised, with "Nestlé's food" and wine to support the strength.

PHTHISIS, PULMONARY CONSUMPTION.

Phthisis may be described as synonymous with consumption, viz. a progressive consolidation and decay of the lungs, with progressive wasting of the body. Thus, as explained in the glossary, it is derived from *φθίω*, to pine or waste away, and is the most fatal and most common disease to which the human race is liable; it may occur in any country, and may attack either sex at any age. It may be hereditary or acquired, and may run an acute or chronic course. Acute phthisis is, however, rare.

Phthisis (chronic), as we generally observe it, is shown by certain general and local symptoms.

The general symptoms are at first dyspeptic. Want of appetite, a faulty digestion, a marked aversion to all forms of fatty food, may for some time precede the cough. This is at first dry, and most severe at night or early morning, but is afterwards accompanied with a clear, sticky expectoration, which may be tinged with streaks or dots of blood. If the expectoration of blood is abundant, vomiting accompanies the cough; hence the term "vomiting of blood" so often employed by patients. In inquiring into the character of the blood, it is necessary to remember that, if it proceeds from the lungs, the succeeding coughs will generally bring up portions of blood which remain behind, the colour becoming darker and darker and finally turning to a dirty brownish-red. If from the stomach, the blood comes away by a single act of vomiting, and then follow black-coloured discharges from the bowels. There is no fixed pain, but often a dull, varying, aching feeling between the shoulders or below the

clavicles. Exertion, such as walking quickly, or going upstairs, occasions dyspnoea, while hurried breathing is a constant symptom. Loss of weight and emaciation from the faulty digestion, or from the accompanying fever, as evidenced by increased temperature and quickened pulse, form valuable diagnostic signs. Sometimes a red line is seen on the gums, and the fingers are often club-shaped and the nails curved.

Some, if not all of these symptoms are found in the first stage of phthisis, and accompanying these, and evidencing the existence of the tubercular deposit in the lungs, are marked local symptoms. The deposit affects, as a rule, the apex of one lung at first, and on percussion in the supra-spinous or supra-clavicular region, want of elasticity is detected, or actual dulness. The expiration is prolonged, and accompanying the inspiration a feebleness or jerking is heard, or dry clicking. When the exudation has become more marked, and has set up more pulmonary irritation, localised evidence of this is shown by sub-crepitant bubbling sounds, or by bronchial or tubular breathing. It should, however, be borne in mind that phthisis may have taken perfect hold of the system and yet there may be an absence of physical signs, or only the slightest indication of them. In such cases the thermometer is of great service, as it will indicate an increase of the evening temperature over the morning to a greater or less extent.¹

In the second stage, with which, for convenience of

¹ This increase I have found most marked on the affected side by half to one quarter of a degree on the Fahr. scale. Thus, if the left lung is implicated and the right is not, the thermometric evening indication will be—right, 99·2; left, 99·6. This increase of temperature was referred to by me in an article to the *Lancet* of 1877, and after that time in all cases of phthisis in my wards in the Glasgow Royal Infirmary the temperature was taken by a surface thermometer over the apices of the lungs. The supposition stated in the article was verified in numerous instances, and when only one lung was affected there was always a difference over that apex of one degree or a half F. M. Peters, of Paris, subsequently, in 1879, and probably without knowing I had written on the subject, claimed it as an original discovery, and in some English textbooks his name and not mine is associated with the fact.

description, the third or last stage is also included, we find the general symptoms to have markedly increased in severity. There is distinct flattening above and below the clavicles of one or both sides. The fever is more pronounced, and is hectic in its type. The system is further weakened by profuse night sweats and diarrhoea. The cough is frequent and irritable, often giving rise to vomiting; the appetite capricious, and digestion greatly impaired. The expectoration is thick, yellow, sinking in a kind of thin glairy liquid, pellet-shaped, or "nummular,"

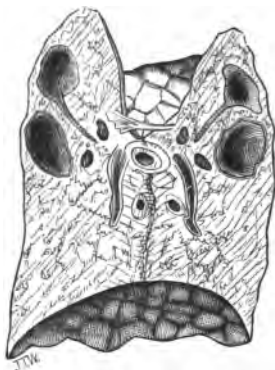


Fig. 6.—SECTION OF LUNG, SHOWING CAVITIES.

so termed from its resemblance to a coin. Later on it loses this character, and becomes distinctly purulent, sometimes having a greenish colour and a most offensive odour.

Should a fatal issue result, as usually happens in this stage, the exhaustion becomes more profound, the night sweats more severe, and, finally, swelling of the feet and ankles is often observed.

The tubercles formed in the first stage have softened and broken down, leaving cavities. The layer of lung forming the wall of the cavity or cavities is usually thick and solid. Hence, on percussion, the sound is dull, or, if

there is a free communication with the open bronchi and the mouth, there is a cracked-pot sound (*bruit de pôt fêlé*). In the course of advanced phthisis "pneumothorax" may occur. Its production is due to perforation of the pleura, through the extension of the degenerated tubercle, and thus air is permitted to enter the pleural cavity. The characteristic symptoms of pneumothorax are mentioned at page 220.

On auscultation gurgling is heard, caused by the air bubbling through liquid. Should the cavity be dry and hollow, "cavernous or amphoric respiration" will be present. These sounds may also often be combined if the cavity contains fluid at its lower part, while above it is to a great extent dry. The vocal resonance indicates "bronchophony" or well-marked "pectoriloquy."

If the student should be asked what are the signs of a cavity, say at the apex of the lung, the answer should be, Dulness over a limited area, or probably a cracked-pot sound—"gurgling," "cavernous breathing," and "pectoriloquy." Frequently a murmur is heard below the clavicles, especially on the left side, following the first sound of the heart, and is presumed to be due to adhesion at the apex of the lung. The shrinking thus occasioned produces a bending, an alteration in the direction of the artery (subclavian), and the blood flowing through the narrowed part gives rise to the murmur.

The elastic fibres of the lung-tissue can at times be detected in the sputa by mixing them with an equal quantity of caustic soda in distilled water 18:100. Boil the mixture, frequently stirring, then add three or four times its bulk of water, and allow it to stand in a conical glass. The deposit contains the elastic fibres. It is sometimes difficult to decide between the probabilities of incipient phthisis and acute bronchitis. As aids to diagnosis, the following points, gleaned from what has been told under the two diseases, are of practical importance as bearing on the cough: pain, temperature, and history. For the cough of phthisis is at first dry and hacking, followed by the expectoration of thin mucous fluid, some-

times streaked with blood; while that of bronchitis begins suddenly with fever and coryza, and is attended with expectoration of a frothy, generally abundant, mucopurulent character, not often blood-stained. The pain in the chest in phthisis is generally wandering, although sometimes it is most felt below the clavicle of one side, or between the shoulders. In bronchitis there is no actual pain, but a feeling of tightness behind the sternum, which feeling is aggravated by coughing. In phthisis the evening rise of temperature is always apparent, while in bronchitis there is no marked difference at night. The physical signs of the disease in phthisis are localised to the apex of one lung, and are persistent there, while in bronchitis they exist equally all over the chest, are of temporary duration, and subside gradually.

Further, the hereditary history and the general appearance and loss of flesh and strength accompanying phthisis, will materially aid, if present, in deciding in favour of that disease if the bacillus of phthisis is also found in the sputum (see page 122).

In the foregoing remarks a typical case of phthisis in its most common form has been depicted. It is to be remembered that there are various forms of this disease, differing, it is true, in symptoms, prognosis, and duration, but not distinguished as distinct pathological varieties. These forms are—

I. ACUTE.—1, Acute tuberculosis; 2, scrofulous pneumonia or acute phthisis; 3, acute tuberculo-pneumonic phthisis.

II. CHRONIC.—4, Catarrhal phthisis; 5, fibroid phthisis; 6, scrofulous phthisis; 7, hæmorrhagic phthisis; 8, laryngeal phthisis.

1. *Acute tuberculosis*.—By this term are inferred all acute pulmonary cases, where miliary tubercle, which has not begun to break down or caseate, is the principal lesion. The general features of such a case are as follows:—It attacks the young of either sex suddenly, with feverish symptoms, great weakness, gastric disturbance as evidenced

by coated tongue and sordes in the mouth. The physical symptoms referred to the lung are cough and slight expectoration, with fine crepitation and bronchial rhonchus replacing the ordinary vesicular pulmonary sounds. The patient wastes rapidly, death occurring with collapse within a few weeks of the commencement of the disease. Sometimes cerebral symptoms, pain in the head, vomiting, intolerance of light and sound, delirium, indicate that the meninges as well as the lung are the seat of miliary tubercle. The temperature keeps high, 100° or 102° F. There is an absence of hæmoptysis—generally, family predisposition. The post-mortem examination reveals lungs permeated with miliary tubercle, soft in character, but not caseated. This tubercle may also be found in the brain-membranes, peritoneum, and pleuræ.

2. *Acute phthisis* or *scrofulous pneumonia* is a rare disease, and runs a rapid course. It seems dependent on tubercular degeneration following catarrhal pneumonia; the pneumonic consolidation, instead of undergoing resolution, breaks down into soft cheesy matter, with the formation of cavities of various sizes, at times all over the chest.

It is attended with a sudden onset, shivering followed by a high fever, pain, cough, dyspnoea, profuse sweatings, rapidly increasing weakness and prostration. The pulmonary mischief is evidenced by hurried breathing, and small and large crepitations not localised but general. There is usually an absence of tubercular symptoms in other organs.

In the only two cases I have seen, death occurred in less than five weeks. This is about the usual duration of the disease.

3. *Acute tuberculo-pneumonic phthisis* seems a connecting link between the two forms described, as it is frequently associated with tubercle in the intestines, and rapid tuberculisation of the lungs.

4. *Catarrhal phthisis* is described under pneumonia, page 194.

5. *Fibroid phthisis* is a term introduced by Sir Andrew

Clark to indicate cases of which fibrosis is the principal feature. It is generally secondary to attacks of pleurisy or pleuro-pneumonia, resulting from long-continued irritation of the lungs through the inhalation of dust or grit. It prevails among fork and knife grinders, colliers and button makers. It differs pathologically from fibroid pneumonia, described at p. 195, in this respect—that the consolidation associated with the fibrosis of phthisis tends to break down, undergoing molecular death or disintegration, that of fibroid pneumonia presents no such tendency. The symptoms associated with this variety of phthisis are immobility of the affected side, dulness throughout, and shrinking to the extent of one or two inches when compared with the sound side. This shrinking causes displacement of other organs. The stomach rises. If the left lung is affected, the heart is tilted outwards, and is left uncovered by the shrinking lung. If the right lung is the seat, the left may be drawn partly over the chest, so that the area of resonance is markedly increased. The impulse of the heart may be traced to the fourth interspace of the right side. The liver rises up to the fifth rib. The pulse is slow. The temperature rarely rises above normal. There is marked dyspnoea, which increases with the development of the disease, and the end is ushered in with signs of obstructed circulation, dropsy, albuminous urine. The patient dies either from dyspnoea or blood-poisoning—symptoms rarely accompanying ordinary phthisis.

6. *Scrofulous phthisis* is the term applied when lung complications of a phthisical nature follow on scrofulous affections of joints, caries, lumbar or psoas abscesses. The symptoms are those associated with ordinary phthisis, with this difference, that the temperature is markedly high, 102° to 104° F. evening, and 98° to 97.5° F. morning, and the night sweats are usually more pronounced and exhausting.

7. *Hæmorrhagic phthisis*.—A term applied by some writers to a form of phthisis where large and repeated hæmorrhages from the lung are the principal features,

these symptoms being attended with few localised pulmonary signs. It is more common in men than women—5 to 1. It is rarely hereditary. The attacks at first are sudden, and seldom fatal. But, if repeated, they lead to the ordinary form of pulmonary phthisis. It is supposed that the hæmorrhage is due to small tubercular ulcerations, eating into one of the vessels of the lung.

8. *Laryngeal phthisis* (see page 176).

Treatment.—The general treatment is indicated under tuberculosis. With regard to other remedies, cod-liver oil has deservedly been the sheet-anchor of the profession for many years. It affords the greatest amount of nourishment in the smallest form, and should be commenced in teaspoonful doses at first, mixed with lime-water, and gradually increased. It can also be given in the form of an emulsion (F. 65*d*). The oil may also be rubbed in externally, especially if the stomach cannot digest it. Glycerine can sometimes be taken with advantage in dessert- or table-spoonful doses thrice daily, either alone or with the syrup of the iodide of iron in a bitter infusion. Pancreatic emulsion has by some been considered beneficial. Malt extracts have recently met with considerable favour. For children and young people butter eaten with bread is an excellent substitute for oil; they will increase in weight, if it is given in large quantities daily, say from two to five ounces. Adults who cannot digest oil often improve on fresh cream, to which is added some salt, sugar, and rum. Counter-irritants, as croton oil, or iodine paint, may also be employed over the front of the chest.

It is better to allay the cough with inhalants than cough mixtures. The hop inhalation can be specially recommended (F. 52).

Opium, or some of its preparations, forms the essential ingredient in all useful cough mixtures, and must be given when it would be cruel and impossible to dispense with these (F. 71). The injection of ergotine is to be recommended in severe hæmoptysis, with gallic acid internally (F. 19), ice-cloths over the chest, and the sucking

of ice. Hazeline, a new remedy, is by some considered very effectual in checking all forms of hæmorrhage. It may be given in 3ss. doses every two hours. To control the diarrhœa chlorodyne is useful ; and to prevent sweating the hypophosphite of lime or the injection of atropine is highly serviceable. I have seen much benefit following the use of the hypophosphites in the early stages of hereditary phthisis (F. 82). The following treatment has been recently recommended in acute phthisis :—Careful nourishment, stimulants in small quantities at regulated and repeated intervals, the subcutaneous injection every night of $\frac{1}{100}$ of a grain of atropine, with antipyretic remedies in the form of iced cloths to the abdomen, 10 to 30 grains of quinine in one dose daily ; or one grain of quinine combined with half a grain of digitalis and a fourth of a grain opium, as in “Niemeyer’s pill.”

Alcohol may be given freely in all stages of the disease. It tends to check the destructive process ; it frequently allays the cough better than anything else ; and it does not raise the temperature. If the case is not too far advanced, and the patient can afford it, a sea voyage should be tried ; and, if circumstances admit, a residence for some time in a warm and equable climate, such as Torquay, Hastings, Mentone, Nice, Algiers, or Madeira, or the pure and elevated atmosphere of Davos may be selected if there is manifest arrest of the disease.

EMPHYSEMA.

Emphysema denotes an excess of air in the lungs, whether due to distension of the air vesicles or dependent on the presence of air in the outer lobular tissue—the latter being caused by an injury, as a stab or a broken rib, and consequently belonging chiefly to the province of surgery.

Of the first form of emphysema, which is that met with in medical practice, there are three chief varieties recognised by pathologists—1, partial lobular ; 2, lobular ; 3, lobar.

The first variety is rarely seen alone, but exists with the second in connection with chronic bronchitis and long-continued cough. The third—the lobar—is the most important, and may invade one or both lungs.

With reference especially to lobar emphysema, it may be stated that there are two different theories as to its aetiology.

These are known as the Inspiratory and Expiratory.

a. The Inspiratory Theory.—This theory is based upon the following considerations:—When a portion of lung contracts or adhesions exist, rendering respiration in that part or parts impossible, some other part or parts of the lung must be over-distended with air, and this compensatory distension results in emphysema. Thus we often find emphysema round cicatrices or adhesions at the apex.

The inspiratory force distends the lungs. The pulmonary tissue has lost a portion of its elasticity and no longer contracts when the distending power ceases. On other occasions further distension follows, and the lungs become greatly enlarged. This inspiratory theory seems correctly to explain lobar emphysema.

b. Expiratory Theory.—Violent expiratory efforts with closed glottis cause increased pressure, as can easily be seen by experiment. This pressure acts on the least supported parts of the lungs; and we find emphysema at the outer margins, apices, and base of the lungs. Doubtless this theory explains the lobular variety of emphysema, which is mainly produced by expiratory efforts of an intense character, as by prolonged coughing or blowing on wind instruments.

The two theories, impartially considered, seem to fit in naturally, the inspiratory to explain the “lobar,” and the expiratory the “lobular” variety of emphysema.

A form of lobar emphysema, which some consider as a distinct type of the disease, is seen in old age, and is termed “Senile.” This is simply an atrophy of the tissues between the vesicles and the infundibula. The loss of elasticity in the chest walls from age aids in pre-

venting complete expansion of the lungs. In process of time the lungs, though theoretically they should be larger, are not so in reality, but present a somewhat atrophied appearance.

After these preliminary remarks the anatomical characters and symptoms of emphysema will be more readily understood.

In the early stage of emphysema the distension of the air-sacs necessitates tension of the vesicular walls, so that these become obliterated and the air-sacs are smooth. Later on perforation of the air-sacs occurs, and rupture of the fibres of the walls. The openings formed coalesce, and large vesicles result. These changes constitute the essential characters of an emphysematous lung, although there is some variety in their extent. As the result of the changes in the vesicles, the blood supply is altered and the blood-vessels finally are ruptured and atrophied, so that the emphysematous lung, when seen at post-mortem examinations, presents a peculiar, white, downy appearance. The bronchial tubes are also distended, and if emphysema exists in both lungs to any extent, they seem, on opening the thorax, to fill the whole cavity, covering the heart and exhibiting a mass of cushiony tissue, as if pillows had been placed in the thorax.

Does degeneration of the lung vesicles produce these changes? Is the tissue of the lung primarily diseased, or does it simply attend the emphysematous affection?

The answer to these inquiries is twofold.

1st, In limited emphysema the distension may be simply the result of mechanical violence, as in the lobular form.

2d, In the lobar form there must be degeneration, but of what character this may be does not as yet seem satisfactorily determined, except that it assumes some form of mal-nutrition of lung tissue.

Symptoms.—The chest in emphysema is peculiarly shaped—pigeon-breasted in the young, barrel form in the adult. The gait is stooping, the ribs are prominent, and the intercostal spaces are depressed. The countenance

is livid and cyanotic, the nostrils are dilated, and the voice is feeble. If the disease is extensive, there is a general increase of the thoracic walls, and on percussing it will be found that the liver is depressed and that the cardiac dulness is gone. The distended lungs overlap the heart, and the apex beat may not be detected on palpation.

Percussion over the expanded thoracic walls reveals exaggerated resonance or perhaps dull tympanicity (Gairdner).

Auscultation shows the inspiration short and quick, the expiration prolonged and wheezing, the latter sound being characteristic of the disease.

Emphysema is generally complicated with bronchitis of a congestive, non-inflammatory character. Repeated attacks may occur, and are attended by fibrinous clots in the heart and the vessels arising from it.

Asthma accompanies emphysema frequently. The right side of the heart is affected first, and ultimately the hypertrophy extends over the whole organ. Valvular disease may supervene. The circulation becomes embarrassed, and more or less venous congestion is apparent, ending in general dropsy, and ultimately in exhaustion and death.

In the interlobular form the air vesicles may be ruptured from without, as by a broken rib; or from within, as by obstruction of the larynx from croup or diphtheria. Thus air escapes into the connective tissue outside the vesicles, from which it may pass to the roots of the lung, neck, or the subpleural tissue.

In forming a diagnosis of emphysema, the history is of great importance; for if the patient has had chronic bronchitis, asthma, tubercle, or violent hooping-cough, or difficult establishment of respiration in childhood, we may suspect emphysema.

Further, difficulty of breathing, with a distressing feeling of oppression behind the sternum, accompanied by cough with opaque yellow expectoration, is a pretty constant sign.

Treatment.—In this disease we can only palliate, as a cure from the nature of the lesion is impossible. The patient should be clothed in flannel, and avoid damp and cold, and, when circumstances admit, should live during the winter months in a dry, warm climate. His food should be nourishing, and digestive arrangements carefully studied—action from the bowels being necessary every day.

Medicinally, it is found that arsenic long continued, in the form of liquor arsenicalis, may be of benefit; and also, when the same remedy is employed, in “arsenical cigarettes,” for which the formula of Trousseau was—

Arsenite of Potassa, gr. xv.

Aq. Destill. ℥i.

Unsize white paper is thoroughly soaked in this solution, dried, and cut into twenty equal parts, and each part rolled into a cigarette. Two or three of these are smoked daily.

The hypophosphites, in the form of syrup (F. 82), do good if they do not interfere with digestion. Easton's syrup is also a valuable remedy.

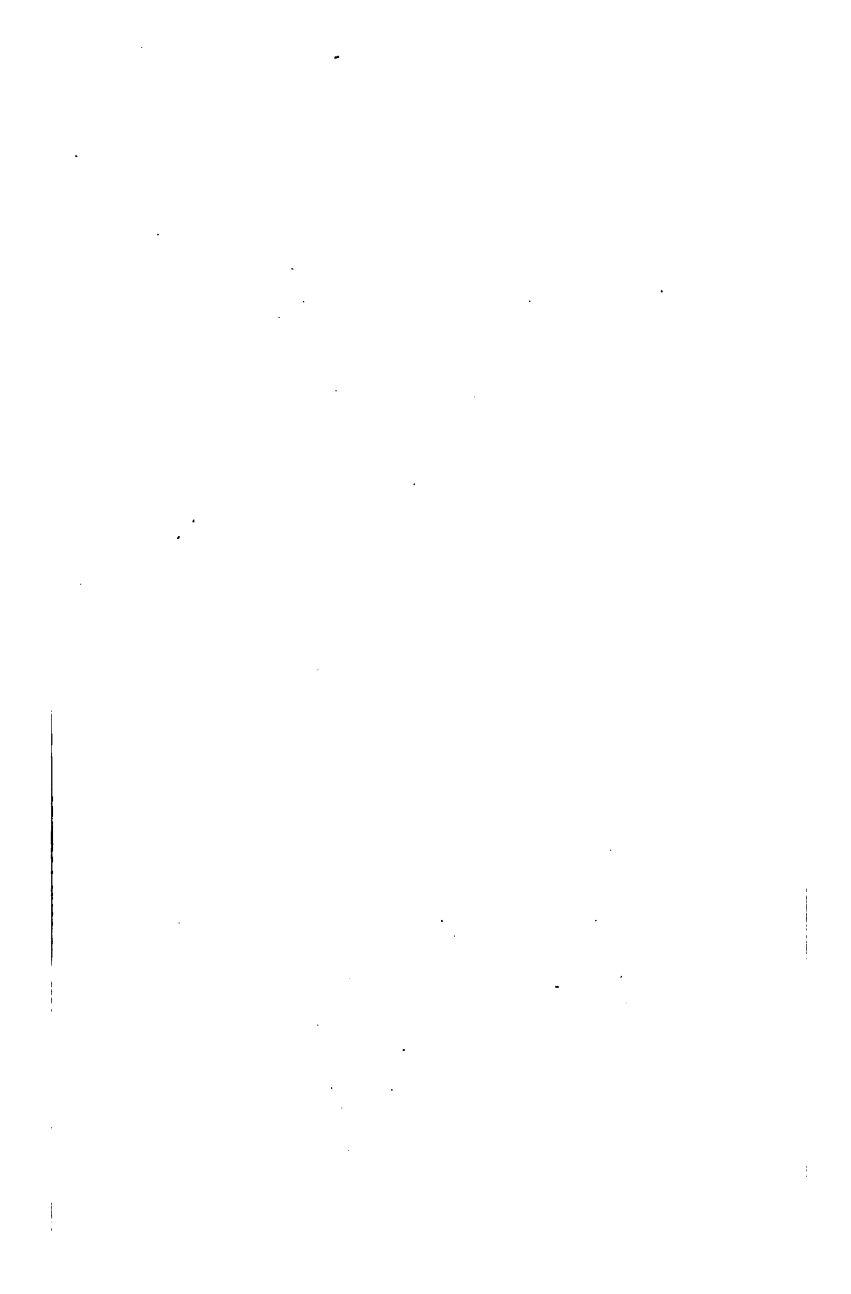
Iodide of potass has been recommended (F. 3).

The inhalations of the muriatic thermal alkaline springs of Ems are very serviceable.

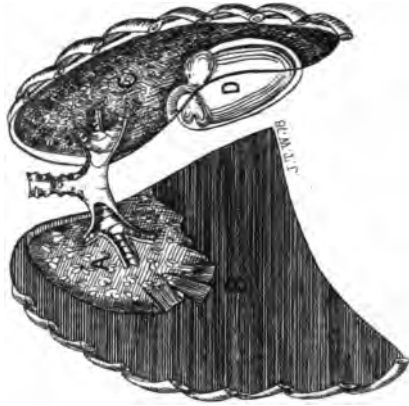
In summer a pine-wood region, with a heavy dew-fall, relieves the oppression of the chest, and so also does the use of compressed air.

To relieve an attack of emphysematous asthma, a draught of tinct. lobeliæ m. xxv., sp. aeth. nit. m. xx., tinct. conii m. xx., mist. amygdalæ ℥ss., is beneficial; or, ol. terebinthinæ ℥i., aquæ menthæ piperitæ ℥iv., sacchari et pulveris acaciæ āā ℥i.—A tablespoonful every three hours.

The injection of $\frac{1}{12}$ of a grain of apomorphia seemed to act very well in a series of cases tried by me with it at the Glasgow Royal Infirmary. Free vomiting occurred in about ten minutes, which was succeeded by gentle perspiration and refreshing relief from the spasmodic cough, sometimes terminating in sleep.

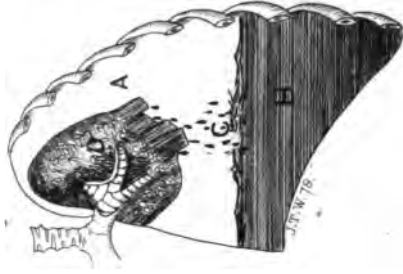


PLEURITIC EFFUSION.



- A.—VOCAL RESONANCE INCREASED ABOVE (BRONCHOPHONY);
DIMINISHED COMPARATIVELY BELOW (EGGPHONY);
- B.—VESICULAR BREATHING ABSENT.
- C.—PUERILE BREATHING.
- D.—HEART DISPLACED.

PNEUMOTHORAX WITH EFFUSION.



- A.—PERCUSSION TYPANITIC ABOVE, DULL BELOW (B.)
- C.—METALLIC TINKLING, SPLASHING ON SUCCUSSIO.
- D.—AMPHORIC BREATHING HEARD OCCASIONALLY.

The later stages of emphysema, with dropsy and an impeded circulation, may be palliated for a time by infusion of digitalis in teaspoonful-doses thrice daily ; or, when this fails, by syrapi scillæ ℥i., sp. æth. nit. ℥iii., aquæ destillatæ ℥vi.—A tablespoonful every two hours.

PLEURISY.

Pleurisy was the designation given at one time to every pain connected with the chest, but now it is exclusively applied to inflammation of the serous membrane lining the walls of the thorax and investing the lungs. It may thus be either single or double, according as one side or both sides are affected. It may also be either acute or chronic.

Symptoms.—In acute pleurisy the attack is usually sudden, and there may be no premonitory chill, as in pneumonia. Pain is, however, generally felt, acute and lancinating, chiefly in the mammary region, and is increased by cough and inspiration. On account of the pain, the respiration is voluntarily impeded. The cough is short and dry. These local symptoms are attended with headache, anxious countenance, hot skin, and rapid pulse. The temperature does not rise so high as in pneumonia, nor decline so rapidly, but tends to fluctuate.

In the early stages, if the stethoscope be applied to the place where the pain is felt, the opposed pleural surfaces are heard grating against one another, and producing what is termed "the friction sound." The surface of the pleura is roughened by the effusion of a thin layer of lymph on it, which can be seen on post-mortem examination as a rough coating, like fine chamois leather. This sound only lasts a short time, for, should resolution have occurred, it ceases, and the investing membranes glide over one another as in health ; or adhesions may have formed between them ; or, as most frequently happens, an effusion of fluid has taken place into the cavity. The fluid in the pleural sac may be purulent, constituting what is termed "empyema," and this pus may seek an

exit either internally or externally. If internally, an opening is made into the same lung through the pulmonary pleura, and the matter is evacuated by expectoration ; or it may make its way externally through an intercostal space, and usually at the most dependent part. If the opening thus formed does not close, we have what is termed bronchial fistula if the opening is internal, or parietal fistula if external. In this way air may reach the pleural cavity, and thus we have pneumothorax, or if serum as well, hydropneumothorax. The word Pyopneumothorax applies to the cases where pus and air exist at the same time in the pleural cavity.

The effused matter, consisting of serum or pus, gives well-marked indications of its presence. On percussion we find dulness corresponding to the extent of the effusion, and this dulness may be complete or partial according as the fluid fills the whole or only part of the pleura. The dulness, also, if the effusion is partial, will vary with the position of the patient, the fluid gravitating to the most dependent part, except where it is bound down by adhesions, in which case no change of level occurs on the patient changing his posture.

The lung is pressed back against the vertebral column, and if this compression is so complete as to prevent any air entering it, on auscultation we can hear no breath-sounds at all. If, however, we listen at the back, where the compressed lung is in part acting and allowing air to enter, or, more definitely, in the interscapular region of the affected side, we may detect increased resonance and bronchial breathing ; the latter being like that of pneumonia, only softer to the ear and more superficial. Sometimes, when the patient speaks, the voice appears faint, distant, and trembling, like the bleating of a goat ; it is then termed "ÆGOPHONY."

At the outset of the illness the patient lies on the sound side, probably to diminish the tension and lessen the pain of the affected side ; but as the disease advances and effusion ensues, this position cannot be retained, because the effusion would then involve not only compression of

the lung on the affected side, but compression also of the sound lung, through the displacement of the mediastinum ; hence it is seen that the patient lies on his "back," or on the "affected side," if the pleurisy is single and the effusion great. Moreover, the effusion, if great, may cause considerable displacement of organs. Thus the diaphragm may be depressed and the liver displaced downwards if the effusion is on the right side. In extreme cases on the left side the heart may be so shifted as to be seen beating on the opposite side. The unaffected lung in single pleurisy is thrown into increased activity, and the sounds becoming more distinct occasion what is termed "PUERILE BREATHING." The intercostal spaces may also be flattened or even bulged out, while the intercostal muscles do not rise and fall as in the healthy state. The measurement of the affected side will also show an increase as compared with the sound one.

Duration.—This varies ; sometimes amounting to five or six days, sometimes to as many weeks.

Termination.—The effusion may never have become purulent, but may be absorbed, as indicated by a gradual diminution of the dulness ; and, if there are no adhesions, the lung will resume its natural size and functions. If it is bound down by adhesions we may find that it will not proportionately expand, but shrink in comparison with the other side, or empyema and hectic fever may result ; or there may be an aggravation of the symptoms, swelling of the hands, dyspnoea, and death ; or the disease may pass into the chronic state.

Varieties.—Usually pleurisy is single, but the disease, although primarily affecting one side, may spread to the other, constituting double pleurisy. Sometimes there is little fever, little pain, no dyspnoea, and yet an extensive pleuritic effusion—Latent Pleurisy. Diaphragmatic Pleurisy is characterised by pain in the hypochondriac region reflected to the clavicles, great dyspnoea, cough, intense fever, and vomiting.

Diagnosis.—Pneumonia and pleurisy have certain things in common, viz. pain in the side, fever, dyspnoea,

oppression, cough, and dulness on percussion. The dulness in pleurisy is, however, more complete, the elasticity of the lung being more fully lost, and it is associated with absence of respiration, of voice sound, and of vibration ; and further, there is no fine crepitation and no rusty sputum as in pneumonia. Cancer of the lung presents physical signs closely resembling those of a pleural effusion. It does not, however, cause enlargement of the affected side, and it is also a disease so rare as practically to be left out of account, unless the history and the cancerous cachexia, and the probably "red currant jelly expectoration," point to its occurrence. To tell whether the fluid is still serous or has degenerated into pus (empyema), is a point of great practical importance in regard to treatment ; for, if purulent, medicinal absorbent treatment is valueless. This point can only be determined by general considerations, unless an experimental puncture by the aspirator is resorted to ; yet a history of a long continuance of the disease, and of shiverings, night sweats, hectic fever, and rapid emaciation, indicates the probability of empyema. Intercostal neuralgia may simulate the first stage of pleurisy, but is distinguished from it by the pain not being aggravated by breathing, and by the absence of friction sound and fever.

Prognosis.—Favourable if single and primary ; unfavourable if the effusion becomes purulent. If secondary to other diseases, it may so complicate matters as to be the immediate cause of death. As will be seen from the foregoing remarks, the pathology of pleurisy may be shortly stated thus :—

1. Some redness of the pleural surfaces.
2. Exudation partly serous and partly fibrinous, the fibrin being deposited on the inflamed surfaces ; and as inflammation goes on this fibrin is replaced from below upwards by an inflammatory growth comparable to granulation tissue.
3. The fluid may be absorbed, and thus the two granulating surfaces coalesce, obliterating the cavity.

4. The fluid may increase and become purulent, as previously noted.

The treatment most consistent with the sketch of pleurisy given seems to be this:—If the case is seen in the early friction stage, leeches should be applied to the seat of pain, followed by hot poultices and the administration of a purgative, the latter being succeeded by a soothing expectorant mixture (F. 43). Tincture of aconite in drop doses every half to one hour for twenty-four hours is recommended before effusion has taken place. This remedy is sometimes combined with tinct. opii, as—

R. Tinct. Aconiti ʒii.

Tinct. Opii ʒvi. M.

—Eight drops in water every hour or two hours. In early stages also hypodermic injections of morphia are serviceable in arresting the pain and diminishing the morbid process; or opium may be given combined with calomel in the form of a pill. Controlling the movements of the affected sides by straps of sticking-plaster has been found useful in preventing effusion. If effusion has already taken place, then it is necessary to promote absorption. Of the remedies most useful for this, special mention must be made of a pill containing squill, digitalis, and mercury, given thrice daily (F. 36). This should be followed by the iodide of potassium, with rest in bed, nourishing diet, wine, and the local application of small blisters, or of the unguent. iod. hydrarg. (F. 5).

A new mode of treatment has recently been recommended by Concato of Bologna, which consists in compressing the sound or healthy side of the thorax twice a day, during five to fifteen minutes each time. Benefit is said to be apparent from the first, and rapid absorption takes place if the effusion is simply serous. This mode seems a natural one of promoting absorption; and, if proved by further experience to be successful, would, in a great measure, supersede the necessity for paracentesis, the absorption being completed before the effusion becomes purulent.

If the serum, however, appears to have degenerated into pus, as indicated by hectic fever and perspiration ; and if the supposition is verified by an experimental puncture with a needle, then, as pus cannot be absorbed, paracentesis should be adopted without delay. There can be no object in leaving pus in the pleural cavity.

The best position for the puncture, because generally the most dependent and the least likely to do harm, is between the seventh and eighth ribs, a little inside the scapula and towards the axillary line, care being taken to avoid wounding the intercostal artery. An incision, one to two inches in length, may be made in this situation parallel to the ribs.

The pus comes away freely. The imprisoned lung, unless bound down by adhesions, rises up to fill the cavity made by the exit of pus, and the insertion of a small tube secures free drainage.

There is no necessity to syringe the cavity if the pus is laudable, without odour, for syringing tends to irritation. Should the pus, however, be bad-smelling and offensive, syringing is essential twice daily with acid. carbolic. gr. iss., glycerini m. lx., aquæ ℥i. ; or 1 part salicylic acid dissolved in 760 parts of water.

The chances of recovery from empyema are better in children and young adults than in middle-aged persons, or in cases which have lasted for some months. When the pus comes away, as it were, all at once, and entails no prolonged after drainage, the prognosis is favourable.

Should puncture be made with the aspirator when the fluid is not purulent but serous ? This is a grave question. Aspiration should never be lightly undertaken. However carefully performed it is attended with great risk. A bland exudation may be rendered purulent, and a tedious recovery results. In some exceptional cases a fatal result almost immediately sets in. Nature, aided by the means mentioned, generally procures, if patiently waited for, a satisfactory and normal recovery.

The only exceptions to this statement are when death seems imminent by dyspnoea, and the operation is de-

manded to save life ; and when, after a month's duration of the effusion with no fever, percussion reveals no diminution of the dulness. The probability in the latter case is that the lung becomes covered with a fibrinous deposit, and absorption of fluid by ordinary means is impeded.

To perform the operation satisfactorily, the patient should assume a semi-recumbent position, the aspirator should be carefully tested with water to see that it is working properly, and the fluid should be drawn away slowly, rather, I think, by operations at intervals of a day or days than all at once. This remark holds good if the effusion is found to be serous and unstained by blood, but if purulent, do not trust to the aspirator ; let the pus out, and resect a portion of one rib, and if necessary insert a drainage tube, and wash out the cavity daily with the antiseptic lotions previously mentioned.

CHRONIC PLEURISY.

As in simple pleurisy, the pleura is full of fluid to a greater or less degree, but this fluid is milky or purulent, and often coexists with a pulmonary fistula. If the pleurisy be double, it is frequently associated with tubercle.

Symptoms.—As in acute pleurisy after exudation, there is absence of thoracic vibration, complete dulness, and loss of the respiratory murmur, which may be replaced by tubular or bronchial breathing. The side affected remains immovable, the intercostal spaces are filled up, while any other position than lying on the back, or the side affected, is impossible. When chronic pleurisy is primitive, *i.e.* does not follow on an acute affection, it does not announce itself by any local pain ; the fever, if any, is irregular, with little or no dyspnoea. In fact, the pleura may sometimes be full of fluid without the patient being conscious of this. After this mode of invasion, tuberculosis is apt to set in with weakness and enfeebled digestion, followed by hectic fever and night sweats.

Treatment should be tonic—cod-liver oil, syrup of the iodide of iron, and good nourishing soup and beef-tea.

Should there be no indication of tuberculosis or cancer, should the effusion seriously endanger the patient's life by suffocation, and should it fail to be removed by the means mentioned, or by absorbent or diuretic treatment, it is advisable to perform paracentesis (F. 35, 36, 37).

PNEUMOTHORAX.—The condition termed pneumothorax may here be briefly alluded to. Injuries may lead directly to this, as from fractured ribs or blows; but in the great majority of cases the air is admitted as the result of the bursting of a small cavity into the pleura in the progress of phthisis. Sudden severe pain, faintness, and dyspnoea, characterise this occurrence at first, and afterwards the face and lips become blue and swollen. The percussion note is abnormally clear on the affected side, or dull; there is no true vesicular murmur, though bronchial breathing may be detected along the spine. With inspiration, voice and cough amphoric sounds will be heard, and also a metallic echo; auscultatory percussion, the physician listening with his stethoscope, while an assistant uses two coins, one as a hammer, the other applied to the chest as a pleximeter, may elicit a sound clear and ringing, of varying intensity and loudness, and sometimes not unlike the chime of a small clock. Hence it has been called "the bell sound." As there is generally fluid with the air, it may be detected at the base of the pleura by dulness on percussion, by metallic tinkling occasioned by the fall of a drop of fluid on the fluid at the bottom, and by a splashing sound being sometimes produced when the patient is shaken. This latter fact, known to Hippocrates, has sometimes led to its being termed, not merely succussion, but "Hippocratic succussion."

As the consequence of disease of the heart, kidney, or liver, obstructing the circulation, there may be a passive effusion of serum into both pleural cavities, and the condition termed "HYDROTHORAX" is established. It is not a disease of the thorax *per se*, but simply marks the advance to the lungs of the general dropsy of the system.

*DISEASES OF THE CIRCULATORY
SYSTEM.*

**DISEASES OF THE HEART AND
ITS MEMBRANES.**

PERICARDITIS.—The serous covering of the heart is liable to inflammation as the result of cold, of renal disease, of specific fevers, of wounds by fractured ribs, of the extension of inflammation from lungs or pleura; but, in the great majority of cases, pericarditis occurs during an attack of rheumatic fever. The female is less subject to it than the male, in the proportion of one to five.

The result of this inflammation is the exudation of lymph or serum; and in the early stage of the affection, supposing we were enabled to open the body, we would find the membranous sac partly filled with some serum, and probably with a plastic coagulable lymph. At a later stage, the effusion would be found completely to separate the membranes, while layers of lymph have been deposited on their surface so as to form false membranes. At a still later stage, the effusion may have been absorbed, and the two sides become glued together (adherent pericardium).

The deposited lymph we have mentioned, on account of the continual movement of the heart, is laid down in a somewhat unequal manner, or in layers, just as the tide leaves the sand ribbed; or in some instances it is shaggy, like the rough surface of tripe.

Symptoms.—On auscultating at an early stage of the disease, before effusion has occurred, a to-and-fro friction sound is detected, from the serous membranes not gliding upon each other with the ease and smoothness of health. Essentially the sound is of a rubbing character, and has been compared to the unfolding of a crisp bank note, to the rustling of silk, or to the creaking of new boots. The sound heard is essentially that of friction—light rubbing,

scratching, grating,—and the impression borne to the ear is distinct from the generally soft blowing character of an endocardial murmur. It is also distinctly superficial, seeming to proceed, as it were, from a point immediately beneath the chest wall, and further, its occurrence is irregular in the cardiac cycle, following at one time the systole, at another the diastole. Most commonly, also, both of the heart sounds remain audible, the friction murmur being interposed between them. It is not, moreover, propagated to such a distance as endocardial murmurs. These distinctive diagnostic points having been noted, it will be understood, in accordance with what has been observed as to the nature of the effusion, that the friction murmurs are like those of pleurisy, most intense at the beginning of pericarditis, when the amount of exudation is small and the two layers of pericardium are permitted to come closer together, and towards its termination when the fluid portion of the exudation is absorbed, and only the firm fibrinous part is left behind. At the time when the exudation is most abundant, the murmur may disappear, the serous surfaces being held apart by the mass of fluid interposed between them. In this latter case the endocardium is also very often involved, especially the mitral valve, so that there is usually a systolic bellows sound masking any friction sound which might otherwise be detected, and the murmur is permanent, unlike the friction sound, which does not, as we may recapitulate, last long. The patient may indeed die during its continuance, or the effusion may be so great as to prevent the membranes rubbing on each other, or they become adherent—glued together. When effusion has occurred, the dilated pericardial sac assumes a pyramidal form, with its apex upwards towards the second left costal cartilage, its base corresponding with the lower edge of the sixth rib; consequently dulness will be detected on percussion over this area, varying to some extent with the position of the patient. If the pericardium becomes adherent, the dulness will be that of the normal heart. Can you tell if the pericardial adhesions have taken place?

We have no certain signs, but we suspect this to be the case if dulness is unaltered by position or deep inspiration; if, similarly testing, the apex beat remains the same, and if one or more intercostal spaces or the epigastrium seem drawn in along with each pulsation of the heart.

The general symptoms attendant on pericarditis vary, and are sometimes so insidious as to attract little attention. This fact is often noted when pericarditis supervenes in the course of acute rheumatism. Pain, when the disease occurs from other causes, is referred to the cardiac region, and is increased by cough or pressure, or by lying on the left side. The heart's action is irregular and intermittent, and this is more apparent after the fatigue of speaking, or taking food, or any emotion. The patient lies propped up in bed, he has an anxious look on his face, and he breathes with difficulty, while he complains of headache and of disturbed and restless sleep. This restlessness passes into delirium in fatal cases, and is attended also with œdema of the lungs and other symptoms of malaëration of the blood.

Prognosis.—Pericarditis is a grave malady; yet, when occurring in rheumatic fever, it is not so much to be dreaded for its immediate as its after consequences, in producing endocarditis and leaving permanent valvular disease. Should it supervene in the course of a chronic disease, it is generally fatal, the prognosis being specially grave in Bright's disease and in cases of copious and rapid effusion. The prognosis should be determined rather by the complication than by the disease itself.

Treatment.—Pericarditis is usually associated with acute rheumatism, and is observed often in hospital cases on the day or night of admission, the seventh or eighth day probably of this fever. Salicin then does not seem to avert pericarditis, or to lessen its severity when it has occurred; but there is every reason to suppose that had this drug been used from the commencement of the rheumatic fever, in all probability the pericarditis would have been averted, for before the time mentioned the primary fever would have been arrested.

If, however, the signs of pericarditis are manifested, two distinct lines of treatment are advised by eminent physicians—

1. Local blood-letting—the application of twelve leeches to the cardiac region, followed by poultices and complete rest. If effusion occurs, mercury should be given, and preferably

R. Calomel. gr. ss.

Pulv. Antimonialis gr. i. M.

—One such powder every hour until slight salivation is detected. When the acute inflammatory condition is over, iodide of potassium in gr. iii. doses thrice daily may be given with a little bitter infusion, as gentian, and a blister should be applied to the region of the heart.

Opiates are given to produce sleep; and if the heart's action is tumultuous, tincture of digitalis in m. x. doses is prescribed every four hours. The diet should be bland and nutritious.

2. The other treatment is chiefly characterised by the avoidance of mercury. Cold in the form of ice-bags is applied to the chest. This should be continued for two or three hours, but may be removed sooner if the pulse and temperature become normal.

Chloral gr. xxx. is preferred to opium to procure sleep. Pain, if severe, is lessened by local injection of hydrochlorate of morphia, gr. $\frac{1}{8}$ — $\frac{1}{2}$.

The depression of the system is met by wine, hot water and brandy, and quinine.

In both methods of treatment the removal of the fluid by paracentesis is advised when other remedies seem to have failed and life is endangered, the place selected being the fifth interspace, to the left of the sternum, care being taken to avoid wounding the internal mammary artery. A preliminary exploration is made with the trocar.

All authorities seem to consider that although paracentesis is recommended the benefit from the operation is doubtful, a fatal result being rarely avoided.

In pericarditis of Bright's disease, stimulation is necessary and mercury should not be given.

In idiopathic pericarditis leeching and the administration of mercury with young and previously healthy subjects, seem the proper modes of procedure, followed by iod. potass. and small blisters.

Another method of treating idiopathic pericarditis is by blisters over the cardiac region, no internal medicine being given.

ENDOCARDITIS.—By endocarditis is meant an inflammation attacking the lining membrane of the heart. It is usually associated, as has been indicated, with pericarditis; yet by some authors it is contended that it exists as an independent disease. In any case, we do not often see this endocardial inflammation in its early stage. If we did, we would observe—

1st, Increased redness and vascularity.

2d, The membrane thickened and dull.

3d, Vegetations forming and attaching themselves to the valves, which are also involved in the inflammation. The valves may thus become thickened or puckered, or adherent to each other, and their healthy action is permanently impaired.

Symptoms.—Endocarditis, occurring as it does in the great majority of cases during an attack of acute articular rheumatism, Bright's disease, or pyæmia, has its symptoms so much masked by the severity of these affections that its actual existence is only recognised in many cases by the physical signs of valvular mischief which it leaves behind it. There may be, however, indications of its existence at the moment of its onset—general uneasiness about the heart, palpitation, restlessness, cold sweats, and increased fever.

ULCERATIVE OR SUPPURATIVE ENDOCARDITIS.—In this variety of endocarditis an **ULCERATIVE DESTRUCTION** of the heart's substance occurs, and it is characterised by typhoid symptoms, prostration, and a rapidly fatal issue.

Treatment is the same as for pericarditis.

VALVULAR DISEASE (CARDIAC MURMURS).— On listening over the cardiac region in health, two distinct sounds are heard following each other at regular intervals. These sounds have been termed first and second, systolic and diastolic, as the one corresponds to the contraction (systole), the other to the filling up (diastole) of the ventricles. The first sound has its maximum intensity at the apex of the heart; the second at the base, or, more accurately, on a level with the third

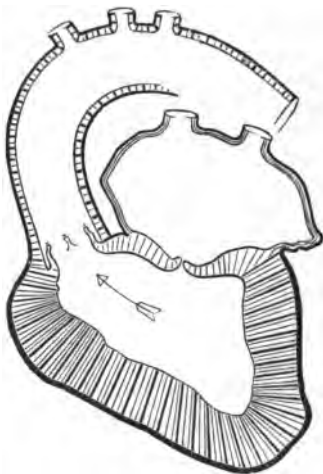


Fig. 7.—VENTRICULAR SYSTOLE.

rib and a little above and to the right of the left nipple, near the left edge of the sternum. In determining, therefore, the state of the heart, it is necessary first to apply the stethoscope at the apex and next at the base on the spots mentioned, and to ascertain whether or not a murmur or murmurs exist, denoting a variation from the sounds of health, and if so, what valve or valves are implicated. If of *exocardial* origin, as has been explained under pericarditis (page 221), the sound heard is rubbing or

grating. It is essentially superficial. It does not follow permanently either the systole or the diastole. It is irregular in point of time in the cardiac cycle. In order to realise what is to follow, it is advisable to leave out of account the right side of the heart, and to fix the attention entirely on the left side, and more particularly the left ventricle, which has two valves in connection with it—the mitral and the aortic. With the contraction or systole of the ventricle (Fig. 7), the mitral valve is

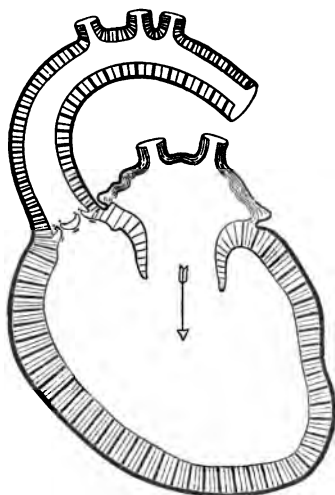


Fig. 8.—VENTRICULAR DIASTOLE.

closed, to prevent blood flowing back into the auricle, and the aortic valves are laid back to allow it to go freely away on its circuit. With the filling up or diastole of the ventricle, the reverse of this happens (Fig. 8); the mitral valve opens and the aortic valves are closed to prevent the blood flowing back from the aorta into the ventricle. If disease has involved one or more of these valves, interfering with their healthy action, a murmur

or murmurs are occasioned, which may be considered "regurgitant" or "obstructive" according to rhythm or the time when they are heard ; and thus we may have one or more of four great classes of murmurs, viz. "mitral regurgitation," "mitral obstruction," "aortic regurgitation," "aortic obstruction." The further great practical fact may be dogmatised thus :—Mitral murmurs are heard loudest at the apex, aortic murmurs at the base ; accordingly, if a murmur is heard following the first sound, it may be termed generally a ventricular systolic (V. S.) murmur. If loudest at the apex and diminished or lost at the base, it is due to mitral regurgitation ; but if loudest at base, it is dependent on aortic obstruction. If a murmur follows the second sound, it may be termed generally a ventricular diastolic (V. D.) murmur, and as indicating its nature, aortic regurgitant. Again, a murmur may be heard following directly neither the first nor second sound, but immediately preceding the first ; it may be termed auricular systolic (A. S.), or præsystolic, or, as more definitely recognising its causation, the murmur of mitral obstruction.

Attention to these considerations will enable the student generally to detect the nature of the lesion, aided as he will be by the state of the pulse, which as a rule is soft and compressible in mitral, and hard and jerking in aortic disease ; and by the pulmonary symptoms, which are more common and urgent in mitral, while cerebral symptoms or complications are more often associated with aortic disease. I purposely say nothing of diseases of the right side of the heart, as they are rare ; and to enter completely into their causation would confuse the conception which it is desirable the student should retain of a single-chambered organ in connection with the subject of heart-murmurs.

The following tables, read, however, in connection with what has been said, can now be understood :—

A.—Mitral obstruction, stenosis, præsystolic murmur, indicates an impediment to the flow of blood from the left auricle to the left ventricle. Recognised by a purring thrill at apex ; a murmur running up to the first sound

and loudest at apex ; a feeble, often irregular pulse ; difficulty of breathing after exertion. It occasions sometimes little uneasiness ; sometimes pulmonary congestion and spitting of blood ; sometimes it terminates in sudden death.

B.—Mitral regurgitation, incompetence, an imperfect closure of mitral valve, permitting blood during contraction of ventricle, to flow back to the auricle. Recognised by a blowing murmur following the first sound, and heard loudest at the apex ; diminishing towards or inaudible at the base ; confirmed by its being heard at inferior angle



Fig. 9.—MITRAL REGURGITATION.

of left scapula ; pulse feeble and irregular. Caused by contraction or roughening of segments of valves ; by dilatation of left ventricle ; by irregular contraction of papillary muscles. Resulting in more or less suffering from congestion of lungs, liver, and kidneys ; rarely in sudden death.

C.—Aortic obstruction, stenosis, narrowing of orifice, preventing blood flowing easily from the left ventricle into the aorta. Recognised by a murmur following the first sound, heard loudest at the base, at second intercostal space of right side, always propagated to the vessels

of the neck, and having its point of greatest intensity at the right border of the sternum in the second intercostal space, *sometimes with considerable intensity downwards along the sternum*; pulse small, hard, and diminished in volume, in later stages soft and slow. Resulting often in little suffering for years in consequence of compensating hypertrophy of left ventricle. But, when compensation begins to fail, there are frequent attacks of dyspnoea and hæmoptysis, and fits of faintness and dizziness from anæmia of the brain, the patient being conscious but having no command of motor power. In contrasting it

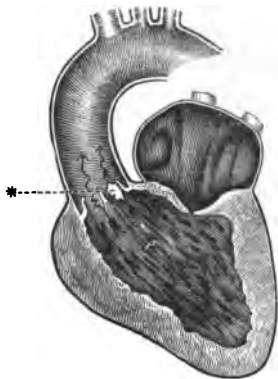


Fig. 10.—AORTIC OBSTRUCTION.

with "mitral stenosis" the comparison is far more favourable with regard to the duration of life.

D.—Aortic regurgitation, incompetence, an imperfect closure of the aortic valves, causing regurgitation.

Characterised by a murmur accompanying the second sound, whirring, rushing, diffused more or less along the whole sternum, although perhaps loudest at the third right costal cartilage. If the insufficiency is very great, a reduplicated murmur, both systolic and diastolic, may be heard by pressure with the stethoscope when auscultating over the crural artery; while a shotty jerking pulse—

"pouls de Corrigan"—is characteristic. So long as the increased force of the left ventricle suffices to prevent any stagnation of the circulation, there may be years of undisturbed good health; but, when once compensation becomes imperfect, the reaction on the venous system—induced by the stagnation and the dropsy—leads to a rapidly fatal result, and sometimes it ends in sudden death. Sudden attacks of dyspnoea and oppression, a spasmodic pain beneath the sternum, are often observed; fainting and dizziness, indicating disturbed cranial circulation, are most unfavourable symptoms.

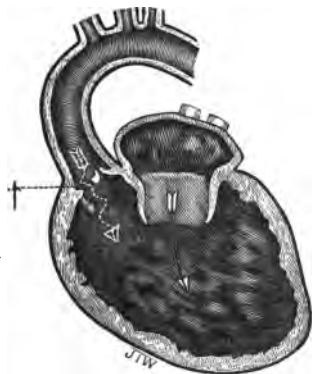


Fig. 11.—AORTIC REGURGITATION.

E.—Tricuspid obstruction: rare.

F.—Tricuspid incompetence, regurgitation, imperfect closure of tricuspid valve. Recognised by increased dullness of right side of heart; diffused pulsation over the right ventricle; murmur with the first sound; pulsation and fulness of jugular veins; dyspnoea and dropsy; generally associated with mitral regurgitation or emphysema.

G.—Pulmonary stenosis: rare.

Pulmonary incompetence is also rare, and is detected by its situation over the pulmonary valves, by its loudness and non-propagation from this spot.

It must be remembered that these murmurs are frequently combined—the most frequent combination being aortic obstruction and regurgitation; mitral obstruction and regurgitation; various combinations of mitral regurgitant and aortic murmurs. These murmurs, which are termed organic, are permanent, and must be distinguished from another class of murmurs, denominated “functional,” “inorganic,” accidental,” “anæmic” murmurs. These are generally associated with chlorosis and other chronic diseases leading to altered condition of the blood. They are also sometimes noticed in acute diseases, as pneumonia,

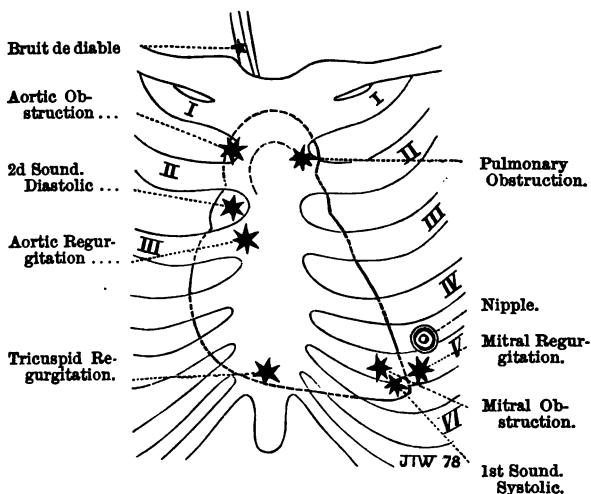


Fig. 12.—AUSCULTATION OF HEART SOUNDS. POINTS OF GREATEST INTENSITY OF DIFFERENT MURMURS.

typhus, scarlet fever, or small-pox. They are distinguished by the following considerations from the permanent or organic murmurs:—

1. They are soft, feeble, blowing; never harsh or rasping.

2. They are always systolic, never diastolic.
3. They occur most frequently at the pulmonary orifice, next at the mitral orifice; very seldom at the aortic or tricuspid valve.
4. They are, especially in chlorosis, combined with murmurs in the veins of the neck.
5. If the health improves they disappear.

ANY PRÆSYSTOLIC OR DIASTOLIC SOUNDS INDICATE ORGANIC CHANGES. The diagram on the preceding page indicates the points of greatest intensity of the chief murmurs mentioned.

Prognosis.—No very definite rules can be laid down in the prognosis of heart disease, unless accompanied by so many exceptional circumstances that they become valueless. While this is the case it may be said generally that tricuspid disease has the worst prognosis; next mitral regurgitant, next mitral obstruction, next aortic regurgitant, and lastly, the most favourable prognosis may be given in aortic obstruction.

Both forms of aortic disease are compatible with prolonged life and little suffering, the most favourable indications being that the second sound is heard over the carotids, and that the murmur is conducted to the left apex. This latter fact shows that the heart is not being robbed of its blood and consequent nutrition, as the aortic segment is non-coronary in its blood supply. When non-compensation exists in aortic cases, as evidenced by swelling of the feet, and albumen in the urine, the disease marches rapidly to a fatal termination, this being rarely averted for more than fifteen months.

In mitral disease, the symptoms of non-compensation are revealed by pulmonary embarrassment—dyspnoea, cough, etc., and the danger of cerebral embolism is always present. Yet with quietness and rest, and freedom from worry, both forms of mitral disease are compatible with long life.

In what class of valvular disease is sudden death most common? The broad answer is, In aortic disease more than mitral regurgitant. Mitral obstruction is, however,

frequently terminated by sudden death, and this tendency is heightened if mitral regurgitation exists with obstruction.

Treatment.—The question of treatment in diseased valvular conditions of the heart depends chiefly on the nature of the lesion, the time of its discovery, and the giving or withholding of digitalis. A valvular organic murmur, single or combined, having been detected, all prophylactic treatment is valueless; and we possess no means of remedying what must be a permanent defect. *Post-mortem* appearances in heart disease indicate the compensatory efforts of nature to overcome or modify the various obstacles to, and deficiencies of, the proper flow of blood from the central organ. The indications of all well-directed treatment, therefore, are to follow the suggestions of nature, and assist the development of compensation when already in existence, to maintain it as long as possible, and to moderate over-compensation. Further, in affection of the aortic valves, clinical experience testifies that when the heart muscle is well nourished, and the bodily stamina maintained by a carefully regulated diet, avoidance of all unnecessary excitement, spirituous liquors, and smoking, perfect compensation may be maintained for years without any medicinal agent, and average good health may be enjoyed. When the mitral valves are implicated, the same average good health cannot be obtained, for there is always more or less pulmonary mischief revealed on exertion, or through fatigue or excitement, and nature cannot give compensation so complete as to obviate the phenomena of failing health. Hence, while the same precautions previously mentioned should be strictly, even more strictly enjoined, we should endeavour, on the first detection of mitral disease, whether obstructive or regurgitant, to assist nature's compensatory efforts by means of digitalis. When its administration is cautiously regulated in mitral obstruction, it will be found, without entering too minutely into the process, to increase the fulness and regularity of the pulse; to diminish the tendency to spitting of blood; to heighten arterial ten-

sion and counteract approaching dropsy. So also in mitral regurgitation, it dismisses the feeble irregular contractile efforts, and concentrates cardiac action in well-directed beats, and thus saves the over-distension of the right heart. In both cases it may be continued for a considerable time; but if the urine is found to diminish instead of increase somewhat in quantity, it is advisable at once to stop it, and to resume it again as circumstances and prudence may suggest. The tincture is the most convenient form for continuous administration, in doses of 5 to 10 minims, with a similar quantity of tincture of perchloride of iron. In the form of a freshly made infusion of the leaves, in teaspoonful doses thrice daily, its diuretic properties, when these are chiefly desired, are more apparent, and it can be given in this way.

While it is inadvisable to give digitalis in the earlier stages of aortic disease, it will be found in advanced cases, when dropsy has begun, when the dyspnoea is intense, when the compensatory effort has been taxed to its utmost limit—theoretical considerations notwithstanding,—that digitalis in infusion, with acetate of potash, or in pill with squills and mercury, produces marked benefit. Probably this may partly be explained by the fact that in such long-standing cases all the valves of the heart are more or less involved. For, granting that the aortic valves were primarily diseased, we often see in this “stage of disturbed compensation,” with the pulse low, the action of the heart irregular, and the urine scanty, that the diuretic value of digitalis is inestimable in these circumstances. Foreign observers speak highly of its combination with quinine, three grains of the sulphate being administered thrice daily, with from one to two grains of the powdered leaf. To promote cardiac and renal activity where digitalis causes gastric disturbance, or, generally speaking, does not agree with the patient, the inhalation of compressed air, especially in mitral or aortic obstruction, has recently been strongly recommended. It is said that in such cases when Waldenburg’s apparatus is used, the pulse rises, and diuresis is established.

To ease also the irritability attendant on all forms of cardiac disease, and too surely evidencing exhaustion of the organ against mechanical difficulties, the application of cold to the region of the heart is useful. For this purpose, a metal or gutta-percha vessel filled with water or ice, and having a concave surface to fit in against the ribs, may be employed for two hours daily. To obviate the stagnation and slower circulation in the liver and abdomen seen in early stages, rhubarb with quassia or gentian may be prescribed, or, better still, if circumstances permit, a few weeks may be profitably spent in drinking the waters of Homburg or Kissingen, or bathing in the warm springs of Soden. Such means remove the complaint temporarily, and with renewed appetite there comes increased strength.

We have indicated, in a general way, when digitalis is useful, and we may conclude the subject of treatment by it in heart disease by stating that there is a consensus of opinion as to its inadvisability under the following conditions :—1st, In fatty heart. 2d, If there is intermittency of the pulse ; or if intermittency or diminution of urine is brought on during its use. 3d, If it produces vomiting or giddiness. 4th, If there is marked atheroma of the vessels. Its non-employment in the early stages of aortic disease has been explained ; its use or not in the later stages must be left to the mature deliberation of the practitioner, and can scarcely be dogmatically decided upon.

While digitalis is still the sovereign remedy in heart disease, it is necessary to mention other preparations, which have lately attracted attention. Notably, the fluid extract of convallaria seems to do good service, when palpitation and dyspnoea are the prominent features, rather than deficient cardiac contraction. The dose of this extract is from m. xv. to m. xx. every three hours until its effects are produced. Convallaria seems to act well, in valvular diseases of mitral origin, with insufficient activity of the heart muscle. It increases also the amount of urine.

In advanced heart disease, it is inferior to digitalis, but it appears more effective than digitalis in purely functional disorders, as in anæmia or hysteria, and in the depression and irregularity caused by tobacco-smoking. Casca bark in the form of *Tinctura Erythrophlei* v. to x. m., sometimes relieves advanced mitral disease when digitalis fails. *Jaborandi* powdered, about grs. 60 daily in divided doses, is stated to do good in cases especially of aortic insufficiency with dyspnoea and painful palpitation. After a few days' treatment, as indicated, relief is obtained.

Quebracho is affirmed to have an immediate action in diminishing frequency of respirations and increased cardiac contractions. The extract is given in v. gr. doses. *Strophanthus* is said by Professor Fraser to have an action similar to digitalis.

DISEASES OF THE MUSCULAR SUBSTANCE OF THE HEART.

HYPERTROPHY AND DILATATION.

HYPERTROPHY OF THE HEART.—As a preliminary inquiry to the subject of hypertrophy of the heart and other cardiac affections, it may be asked, "What is the area of superficial cardiac dulness in normal cases?"

To answer this the student should percuss very carefully, employing pen and ink to dot out the results of his investigations on the chest. It will then be found that he has a map roughly triangular in form, the right side of the triangle being the mid-sternal line from the level of the fourth chondro-sternal articulation downwards; the hypotenuse being a line drawn from the same articulation to a point immediately above the apex beat; the base being a line drawn from immediately below the apex beat to the point of meeting of the upper limit of liver dulness and the mid-sternal line.

How are the valves situated in the area thus mapped out? FROM ABOVE DOWNWARDS THE PULMONARY COMES FIRST, THEN THE AORTIC, THEN THE MITRAL, AND LASTLY THE TRICUSPID; AND IN REGARD TO THEIR DEPTH FROM THE SURFACE, THE TRICUSPID IS THE MOST SUPERFICIAL, THEN THE PULMONARY, NEXT THE AORTIC, AND DEEPEST OF ALL IS THE MITRAL ORIFICE. Their exact anatomical arrangement is as follows:—The tricuspid orifice extends from the junction of the fourth left costal cartilage with the sternum, behind that bone to the articulation of it with the sixth right cartilage; the mitral orifice lies to the left of the tricuspid valves, immediately behind the fourth costal cartilage; the pulmonary orifice is situated immediately behind the left border of the sternum, at the junction of the third costal cartilage with that bone; the aortic orifice occupies the third interspace, and is about half an inch lower than and to the right of the pulmonary orifice behind the sternum.

These facts being remembered, to understand what is meant by the term hypertrophy of the heart, it is necessary also to have some definite idea of the size of the organ in health, and of the relative thickness of the walls of its different chambers. The size of the heart, all authorities seem to agree, is, in health, about the same dimensions as the closed fist, and it weighs 8 to 10 ounces. The left side of the heart has to do more active work than the right, and nature has accordingly provided it with increased thickness of the muscular tissue to accomplish this. The relative thickness is as follows:—The right side is to the left as two to five; or, speaking generally, the thickness of the left ventricular wall more than doubles that of the right.

Hypertrophy of the heart is therefore most frequently found in the left side of the organ, or that side of the pump which has the most work to do.

This hypertrophy may be of two kinds. In the *first* there is simple enlargement of the muscular walls without dilatation of the corresponding chamber.

In the *second*, not merely are the walls thickened, but

the chamber is also increased in size. The first is termed "simple" or "passive," the latter "active" or "eccentric." The first is rare, the second frequent. Dilatation and hypertrophy thus most frequently go together, and the reason for this is obvious if we look at the condition that causes the hypertrophy. In nineteen cases out of twenty there is some obstacle to the transit of blood to or from the organ. This obstacle may be in the heart itself, or

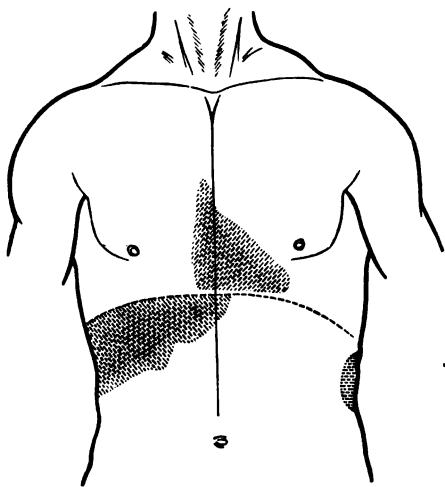


Fig. 18.—AREAS OF CARDIAC, HEPATIC, AND SPLENIC DULNESS.

may be due to its being pushed from its accustomed seat by disease of other organs, such as pleurisy. The former cause is the more common. Thus, if the aortic valves, which act as sentinels to guard and guide the blood from the ventricles, become incompetent, allowing the blood to flow back again, or obstructed, not permitting it to get properly out of the chamber, hypertrophy must result. The heart has to put on increased force to

overcome the obstacle, and has to acquire increased space to contain the greater quantity now in the chamber. If the mitral valve is diseased, there will be an increased quantity of blood within the left auricle, and hence the chamber must be larger. The auricular action is not, however, so forcible as the ventricular, and, as there is not so much increase of power needed, auricular dilatation often exists without hypertrophy.

On the right side of the heart we find increased size and thickness of the right ventricle, where there is some obstacle or too great patency in the pulmonary or tricuspid valves, or some hindrance in the diseased state of the lungs to the proper circulation of the blood, as from emphysema.

Symptoms.—In general the symptoms are developed slowly. They may be broadly enumerated as follows:—palpitation, dyspnoea, pain localised about the heart, and inability for active exertion, such as walking, running, or going up stairs quickly. Symptoms of granular kidney disease, more particularly alluded to at page 334 *et seq.*, will also often be observed. The pulse is usually strong, powerful, and jerking; but it varies with varying causes.

On percussion, the area of cardiac dulness is found to be increased. The direction of the increased dulness varies according to the part of the heart affected. If it be the left ventricle, the extension will be downwards and to the left, giving an elongated shape; while, if the right ventricle be hypertrophied, it comes to form the apex, and thus the outline is square, and the dulness extends to the right. There is a sensible and very distinct heaving impulse communicated to the hand or the stethoscope. The heart-sounds are heard over a largely increased surface, and the apex-beat is carried lower down, and to the left of its normal position. Further, if the hypertrophy be simple, the first sound is obscure and muffled at the apex. If there are hypertrophy and dilatation, the first sound is loud, full, and pronounced; while, should there be valvular disease, murmurs will be heard, varying as to site and peculiarities with the valve impli-

cated. If we remember that hypertrophy and dilatation generally co-exist, a practical summary of the two conditions may be expressed thus:—If the hypertrophy is greater than the dilatation, the dulness of the heart is chiefly increased from above downwards; but when the dilatation is in excess, the dulness is greater transversely.

Treatment must be guided by the state of the patient. If of full and plethoric habit we should restrict the use of rich food, all alcoholic stimulants, tea and coffee. If, on the other hand, of weak and feeble frame, we should order nourishing diet and tonic medicines. To combat the violent impulse of the heart, digitalis is useful; while for dyspnoea, sp. chloroformi with other stimulants must be administered (F. 12).

ATROPHY OF THE HEART.—In contradistinction to hypertrophy or enlargement of the heart, with increase of the muscular substance, we sometimes find the heart atrophied or diminished in weight. The muscular substance becomes pale, soft, and flabby, and easily broken down. The weight of the organ may thus be reduced to one half of what it ought to be, and its chambers are small.

The simple form of atrophy is the result of debilitating disease, such as fever, cancer, marasmus, phthisis; or it may be congenital; or caused by disease of the vessels which nourish the heart's substance—the coronary arteries. It is thus rather a post-mortem appearance than a distinct disease.

Symptoms.—If there is marked diminution of the size of the heart, the area of cardiac dulness will be decreased. The smaller quantity of blood contained in the cavities, and the feebler contracting power of the organ, will render the impulse weak and the heart's sounds indistinct. The pulse will also be found to be small. There are, however, no certain diagnostic signs.

FATTY DEGENERATION OF THE HEART.—There is another form of atrophy in which the muscular texture becomes altered by fatty degeneration. The term fatty

degeneration does not imply that the heart is overloaded with fat, and has on its outside, or even dipping in between its muscular fibres, an increase of adipose tissue. This is rather a deposition and infiltration of than a degeneration into fat, and is better termed a fatty growth—a something superadded. What is meant by the term “fatty degeneration of the heart” in reality is, that the healthy transverse striæ and nuclei of the muscular substance are obscured by groups of fat granules. The muscular fibres are soft, easily broken, and some authorities (Dr. Quain) have pointed out that there is frequently ossification of the coronary arteries.

Symptoms.—The diagnosis is beset with difficulties, the principal symptoms being a slow and feeble action of the heart—pulse 45 to 50—weakness, giddiness, and often faintness. Then, there is what was once considered diagnostic of this disease, well-marked “arcus senilis,” due to fatty degeneration of the margin of the cornea. Yet it must be remembered we may have fatty degeneration of the heart without the arcus senilis, and *vice versa*. Men are more often attacked than women. It comes on at all ages, but is most frequent in advanced life. The prognosis is unfavourable.

It will thus be observed that fatty degeneration differs from a fatty growth of the heart. The latter is usually associated with general obesity, the fat which is normally deposited on the heart being abnormally increased, especially on the surface of the right ventricle.

Treatment can only be symptomatic.

ANGINA PECTORIS.—The introduction of this term into medical nomenclature is due to Dr. Heberden, who in 1768 first described the disease, and stated that the sense of strangling and anxiety with which it is attended may make it not improper to call it angina pectoris (anguish of the breast). It is a rare disease.

Etiology.—Some consider it merely neuralgic, commencing for the most part in the pneumogastric nerve, and spreading in different directions. Militating against

this theory is the fact that it seems brought about by what disturbs the heart's action, viz. mental emotion and bodily exertion, and especially that it is so often suddenly fatal. Dr. Jenner believes that it is due to ossification of the coronary arteries disordering the nutrition of the organ. This does not, however, account for the sudden pain. Generally speaking, it may be said to be essentially connected with fatty degeneration, ossification of the coronary arteries, or some valvular disease of the heart.

Symptoms.—The attack is sudden and without warning, occurring sometimes when, after early breakfast, a patient is walking quickly up a hill. The pain is referred to the cardiac region, and is intense in its character. It may radiate from the heart, as its central origin, to the neck, back, left shoulder, and arm. The suffocating feeling with which it is accompanied gives rise to the fear of impending death. The countenance is pale and covered with sweat; the pulse feeble, small, and fluttering; while consciousness is unimpaired. Increased arterial tension has been found to be notably associated with angina pectoris, and the attack is supposed to be due to spasmodic contraction of some, if not all, of the small systemic and pulmonary vessels.

Fortunately the attack does not last long, generally only a few seconds, but it may be prolonged even an hour. It is paroxysmal in its character, and may be evoked by unknown exciting causes. It is a disease of middle life or advanced age, and is more common in men than women.

The prognosis is necessarily grave, and sooner or later death ensues in the course of a paroxysm.

Treatment.—There can be little doubt that the inhalation of nitrite of amyl is the best remedy for the paroxysm of angina pectoris. The inhalation of two to three drops relaxes the increased arterial tension, and, observation shows, in a few seconds causes the face to flush and the head to appear full. The heart seems to give one strong beat, and from a condition of perfect agony there may be,

in a moment, complete repose. The instantaneous relief experienced by its use has induced many patients to carry about with them glass tubes of nitrite of amyl,—each containing 4 minims,—and at the slightest warning of an attack, to break one, and inhale the amyl sprinkled on a handkerchief. Comparative freedom from attack is thus enjoyed, and walking exercise may be cautiously tried. While the efficacy of amyl is acknowledged in averting the paroxysms, common sense dictates a careful prophylactic treatment: the life should be tranquil, the diet moderate, abstinence enjoined from wine, spirits, and tobacco, and all constriction in dress removed from the neck or the abdomen. As the attacks often occur while walking against the wind or ascending a mountain, common sense and prudence interdict such exercises. Dr. G. W. Balfour, whose opinion on heart diseases is justly considered high, relies chiefly on the inhalation of chloroform to relieve pain and regulate the circulation. He considers liq. arsenicalis the best internal remedy—almost a specific tonic to the cardiac muscle. Dr. Anstie also recommends arsenic. Nitrite of sodium is also used for the same purpose as the nitrite of amyl.

PALPITATION OF THE HEART.—By this term we understand simple increased frequency of cardiac action without any pathological changes which we can recognise as originating it; and as thus understood, it may be defined as an antagonism between different factors of innervation of the heart. The factors of innervation of the heart, so far as recent investigations show, are, according to Schroetter:—*1st*, The ganglia which are found embedded in its substance, both in the auricles and the ventricles. *2d*, Cardiac branches of the ganglion stellatum which pass down to the heart between the aorta and the pulmonary artery, and which take their origin from the cervical portion of the sympathetic. *3d*, Nerve fibres, which originate in the medulla oblongata, run the length of the spinal cord, and pass out from the cord with the spinal nerves. They then become entwined

with the sympathetic of the thorax and abdomen, whose branches in part extend from below upwards to the heart. Irritation of these increases the functional activity of the heart. 4th, Irritation of the sympathetic may act in another way by causing a change in the tone of the vessels, and an accompanying variation of the blood-pressure. Thus, irritation of the sympathetic may cause contraction of the vessels and increased blood-pressure in the aortic system. In this way the labour of the heart is augmented, while, on the other hand, paralysis of the sympathetic, with the accompanying dilatation of the vessels, will cause a diminished resistance in the vessels and a consequent diminution in the labour of the heart. 5th, In opposition to these excitor nerves, we have the so-called restraining or inhibitory apparatus, which is made up of the pneumogastric and its ramifications. If we irritate the vagus, the movements of the heart are slackened in frequency, and finally come to a standstill in diastole; if we divide the vagi the heart begins to beat faster, the power and influence of the restraining apparatus being destroyed.

Varying causes acting on the nervous supply of the heart may originate palpitation—mental excitement, joy, fear, anger, strong tea, alcohol, tobacco, indigestion, exertion, gout.

The symptoms which accompany palpitation without organic disease are variable. Chief among them, in addition to the increased beating of the organ, are dyspnoea, general distress, dizziness, a feeling of faintness, specks before the eyes, flushings or pallor of the face, ringing in the ears, and pain referred to the cardiac region. The causes being diagnosed and removed, the palpitation is cured. While the attack is severe the application of cold cloths to the chest may be employed, and a hypodermic injection of morphia. Preparations of hydrocyanic acid and chloral are also serviceable, and in some cases also digitalis.

DISEASES OF THE BLOOD-VESSELS.

DISEASES OF THE ARTERIES.

Diseases of the arteries may be acute or chronic. The acute form is rarely seen. It is supposed to occur when an embolus obstructs the circulation in an artery, and forms the nidus for circumscribed inflammatory lesions. Ulceration occasionally occurs from this inflammation.

CHRONIC ARTERITIS.—Chronic arteritis may be considered as the first stage of atheromatous disease, and, as such, it may be said to be of frequent occurrence.

ATHEROMATOUS DISEASE—the endarteritis deformans of Virchow—is the arterial disease most frequently met with, and leads to the most serious issues. Three stages are recognised :—

1st, In the first stage grayish patches are observed when the vessel is slit open. They appear to be on the surface, but really are situated between the tunica interna, the internal tunic, and the tunica media, the middle tunic of the artery. In consistence they are semi-cartilaginous, and are the result of an inflammatory change producing a proliferation of cellular elements.

2d, In the second stage, fatty degeneration of the cellular elements has taken place, and the diseased patch is now a yellowish pasty mass. Its resemblance to meal led to the designation “atheroma,” from ἀθήρη, meal. From the pasty stage there are two terminations :—(a) the endothelium may give way, leaving an excavation, which is formed by the middle and external coats of the artery ; (b) in other instances, instead of an excavation, there is a hard calcific deposit which may be termed

The 3d stage of atheroma. Bony plates, without the minute structure of bone, are observed at intervals on the arteries, and sharp spiculæ project into the interior of the vessels. In the aorta these bony plates may be seen in sizes varying from an inch to half an inch long ; and in

the smaller arteries the calcific matter forms a distinct ring round the vessel. The aorta is most often attacked by the change, and next to it the cerebral, the coronary, splenic arteries, and arteries of the lower extremities. The effects of atheroma can be understood, from the changes observed, to be very serious. To the blood current sweeping from the heart abnormal obstructions are offered, and the nutrition of the parts supplied by the vessel is impaired, hence cerebral softening may occur. Sometimes when the pasty changes are washed away blood intrudes between the coats of the arteries, and forms a **DISSECTING ANEURYSM**; or the portion of the vessel weakened by the loss of its internal coat gives way to the pressure of the current, and a **sacculated aneurysm** results; or the diseased vessel bursts. What causes atheroma and endarteritis deformans? The answer is, **Overstrain of the vessel**. And it is not the result of syphilis, as was at one time supposed, but follows on intemperate habits and gout, violent exertion, the granular form of Bright's disease, excessive anxiety and mental effort.

Diagnosis.—The disease can hardly be suspected before middle life, and though the feel of the radial pulse may, to the inexperienced, give the idea of a strong circulation by its fulness and rigidity, this impression is corrected by a sphygmographic tracing, which reveals in atheroma the upstroke vertical and the summit of the tracing extended.

Treatment.—Treatment is mainly preventive. Should an atheromatous condition be suspected it must be our effort to prevent any cause operating so as to produce a hasty termination. Thus alcohol must be avoided, venereal excesses countermanded, prolonged and exciting muscular efforts forbidden. In the case of the brain all things should be excluded which may produce congestion, as mental effort or sleeplessness. In the case of the heart any condition should be guarded against which leads to distension of the right ventricle, and imposes an obstacle to the return of blood, as in strains which involve holding in the breath.

PERIARTERITIS.—This is a term applied by Charcot and Bouchard to inflammation of the perivascular sheath, which, spreading from without inwards, ultimately embraces all the coats of the vessels, giving rise to miliary aneurysms. These aneurysms, and not atheromatous disease, are stated to originate cerebral hæmorrhage.

FATTY DEGENERATION.—Fatty degeneration is a morbid change of “the original cause of which,” according to Rindfleisch, “we know nothing.” It is rare, and seems to appear as velvety spots on the surface of the tunica interna of vessels, leading to erosion and ultimately to rupture of the middle and external coat, or producing a dissecting aneurysm.

CALCIFICATION OR PRIMARY CALCAREOUS DEGENERATION.—Calcification is a senile change and rarely seen. The middle coat of the vessel is the seat of the deposit, which consists of carbonate and phosphate of lime and magnesia. The morbid process is usually limited to vessels in which muscular fibre is abundant, affecting especially the superficial vessels and arteries of the brain.

GUMMATOUS DISEASE.—Gummatous disease is an affection of the cerebral arteries, due to syphilis. The vessels are thickened in the outer coat, and present nodose swellings, which increase considerably their size; the calibre of the vessel is thus narrowed; thrombi and cerebral softening may result. The disease is indicated by a history of syphilis, and, according to Dr. Hughlings Jackson, “by a random succession of nervous symptoms.” The affection may yield to antisyphilitic remedies, as perchloride of mercury and iodide of potassium (F. 10).

ALBUMINOID DISEASE.—*Synonym*—Lardaceous disease.—Albuminoid disease is found in the vessels of the kidney and spleen, not in the larger arteries of the system.

Dilatation of arteries and contraction are sometimes seen without any degeneration of their coats. Such a condition may depend on deficient innervation.

Arterial disease is said to be found invariably in the

brains of the insane, and consists of such alterations as would result from obstruction to the ultimate ramification of the arteries.

ARTERIO-CAPILLARY FIBROSIS is, according to Sir William Gull and Dr. Sutton, a disease of the small arteries, leading to hypertrophy of their coats, and attendant on the cirrhotic form of kidney disease. A diversity of opinion exists as to which coat of the arteries the hypertrophy attacks. Gull and Sutton believe that the external coat is the seat of fibroid thickening, and they further state that this is not caused by the co-existing disease of the kidneys, but that both are parts of a general diseased process. Dr. George Johnson, on the other hand, considers that hypertrophy attacks especially the muscular coats of all the tunics of the small arteries, and is a direct result of the obstruction which impure blood invariably meets with in the capillaries in the form of Bright's disease mentioned.

ANEURYSM.—Atheromatous or other morbid changes lead to dilatation and aneurysm. In some cases the aneurysm is observed where disease has sapped the inner coat, and afforded a pouch for the dilatation of the vessel. At other times the dilatation does not occur there, but at a spot nearer to the heart. This is doubtless due to a slowing of the blood stream at the seat of the disease leading to increased arterial tension on the proximal side, where the aneurysm develops.

THORACIC ANEURYSM.

Those dilatations which are termed aneurysms affect at one time the whole of the artery for a certain distance, and at others only a portion of its circumference, and they may be cylindrical, spindle-shaped, or sacculated. Their size may vary from that of a pin head to that of a man's head, and the walls are almost constantly formed by the diseased arterial coats. Frequently the three coats are distinctly recognisable; at other times only one or two

can be distinguished. The external coat usually survives longest, while the inner or middle coat is the first to give way. The cavity of an aneurysm rarely contains blood in a fluid condition only; usually there is more or less of a fibrinous coagulum deposited in layers over the lining membrane, and sometimes, by this coagulum becoming converted into fibrous tissue, the sac may be filled up and obliterated.

In the great majority of cases the formation of an aneurysm depends on an alteration of the middle coat of the artery—this alteration being the result of atrophy or fatty degeneration. With this general cause many accidental causes may unite in producing an aneurysm. Thus, in vessels already diseased, a fall, a blow, or any violent exertion, may rupture a few fibres or laminæ, and may suffice for the commencement of further dilatation.

Unless due directly to mechanical injury, aneurysms are of most frequent occurrence in middle and advanced life; before the twentieth year aneurysms of the large arteries are very rare. They are more frequent in men than in women, and a laborious occupation or violent athletic exercise tends to their development. The disease is comparatively rare, and its frequency varies in different countries. It is most common in England. In Germany it is less common than in France, and in Italy it is very rare.

There are three chief situations for thoracic aneurysms, which are usually confined to the aortic arterial system, and are seldom observed in the pulmonary artery, viz. the ascending portion of the aortic arch, the transverse part of the arch, and the roots of the large vessels arising from the arch. Most frequently they spring from the ascending arch, and from the convexity rather than the concavity.

Aneurysms of the arch embraced by pericardium are always small in size, and are usually associated or confounded with simple aortic valvular disease. When the aneurysm is situated beyond the pericardium, it frequently attains a very large size, displacing the lung outwards,

especially on the right side, and coming in contact anteriorly with the thoracic wall, where it may ultimately form a visible pulsating tumour. In the interior of the chest it presses on the right lung, and may compress the descending vena cava, and involve the right pneumogastric nerve. An aneurysm in this situation is liable to open either externally or into the pericardium or the right pleura, or the lung itself; an aneurysm of the transverse arch springing from its convex portion spreads upwards and to the left, pressing upon the manubrium sterni, the left clavicle, and the left upper ribs. A tumour is thus formed in the region mentioned, which sometimes rises from the sternum into the root of the neck. If it springs from the posterior surface of the transverse portion of the arch, its course is often latent.

Aneurysms of the descending part of the arch are rarely to be detected until they have attained a large size, although their presence may be suspected if we find dulness, pulsation, murmur, absence of respiration over a limited area, and dull, aching or burning pain over the vertebræ.

The exact anatomical relations of thoracic aneurysms of moderate size may thus be summarised :—

1. Aneurysm of the ascending aorta (the most common variety) forms a pulsating tumour in the second right intercostal space near the sternum.

2. Aneurysm of the transverse part of the aortic arch is situated at the level of the manubrium sterni, but reaches to a variable distance to the left of that bone, according to the size of the swelling.

3. Aneurysm of the descending aorta renders prominent a part of the left posterior surface of the thorax in the neighbourhood of the lower dorsal vertebræ.

General Symptoms.—When the tumour can be detected externally, the diagnosis is easy, but, if this is not the case the symptoms are obscure. Generally speaking, an aneurysmal patient suffers from cough, dyspnoea, difficulty in swallowing, and pain about the chest and back. The pain is usually dull and heavy, but occasionally it

occurs in paroxysms, and is boring and pulsating, and may be increased by mental emotion. With the pain there is often a feeling of tightness of the chest simulating that of angina pectoris. The cough is audibly brassy in character, and attended with a suffocative feeling, by aphonia, and paralysis of one or both vocal cords, if one or both recurrent laryngeal nerves are implicated; and, if the tumour extends deeply backwards, so as to press on the ganglia and branches of the sympathetic, there will be permanent *contraction* of the *pupil* of the affected side.

The physical signs are dulness, "bruit," absence of respiration, or bronchial respiration from pressure on a bronchus. Again, if the transverse part of the arch be the seat, the tumour or pulsation may be felt by placing the finger deeply in the supra-sternal notch. Heart murmurs and pain, or numbness of the arm or side, serve to confirm our diagnosis.

The duration of the disease is uncertain. In thirty cases collected by Lebert the disease lasted from one year to four years. The disease seems to make more rapid progress in young people than in old. The prognosis is necessarily very unfavourable.

For treatment, see page 253.

ABDOMINAL ANEURYSM.

Aneurysms of the abdominal aorta are more frequent above than below the coeliac axis. They are spindle-shaped or saccular (from three to six inches in mean diameter), and often of very considerable size, the contents sometimes weighing as much as ten pounds. They project from the anterior surface or sides of the artery, and tend to develop downwards and to the left more than upwards and to the right because of the liver and the diaphragm.

Symptoms.—A tumour is usually found to the left, just above the navel. On palpation a forcible pulsation is perceived a little after the apex beat and accompanied with a thrill, and along with this thrill a murmur is

heard. The pulsation is almost always single and synchronous with the radial pulse; it is limited to the tumour, and is occasionally accompanied by thrills. A murmur in the recumbent position is rarely absent; it is post-systolic in character, single, blowing, and prolonged. It is rarely transmitted into the vessel beyond. If the aneurysm is situated high up it cannot be palpated, and we can only perceive the pulsation communicated through contiguous parts (liver, spine, etc.) and hear the murmur similarly propagated.

Functional disturbances may also be present in a greater or less degree. The most common of these is pain in the belly and in the back, corresponding to the seat of the tumour. There may also be vomiting, diarrhoea, or constipation.

The general condition of the patient may remain unaltered for some time, or there may be progressive debility. Rupture of the aneurysm is frequent, giving rise to acute peritonitis; or sometimes an aneurysm of this kind may burst into the left pleural cavity.

Diagnosis.—Abdominal aneurysm is difficult to diagnose, for it is simulated by hysteria, uterine or intestinal irritation, dyspepsia, cancerous or other tumours. The leading points in abdominal aneurysm are—

1. Localised throbbing, unassociated with the general symptoms of the diseases mentioned. In these diseases the pulsation is not localised, but may extend to the main arteries of the lower limb.

2. Examination under chloroform will show whether the aorta is normal.

3. In the prone position an abdominal tumour will gravitate away from the aorta, and, although a murmur may be produced with strong pressure of the stethoscope, it does not exist when that pressure is withdrawn.

4. The fixed local pain in the back, aggravated by pressure and motion, may be simulated by spinal rheumatism, but the absence of other local signs of a tumour differentiates this from aneurysm.

Treatment.—The general treatment must be that

advisable in all forms of cardiac disease, viz. rest, and avoidance of all excitement, mental or bodily. Probably Tufnell's method in thoracic as in abdominal aneurysm is the best, the principle being the giving of a spare, dry diet, and the enjoining of strict and absolute rest in the recumbent position. Hence he orders six ounces of milk, two ounces of roast meat, and six ounces of bread and butter daily. By this means the blood tends to coagulate in the sac; just as the passage of a comparatively sluggish stream of water through a pool affords every opportunity for the accumulation of débris on the banks, so in this way, at the sides of the aneurysmal sac, fibrin becomes accumulated in layers and ultimately is moulded into the walls of the sac.

Of medicinal agents, iodide of potassium, in large and increasing doses to the extent of 90 grains daily, is held most in repute. This drug has the support of eminent English and foreign authorities. The use of the *Injectio Ergotini Hypodermica* is also recommended. Ten minims may be injected in the immediate neighbourhood of the tumour, at intervals varying from half a day to several days. The object of this is to diminish the sac by producing contraction of its muscular elements, and the tumour is said to become gradually small and hard; and the pulsation to disappear.

Galvano-puncture in some cases has been successful, the object being to produce coagulation of the blood in the sac. Under favourable circumstances one single electro-puncture may be sufficient; in others, it may require to be repeated after a lapse of some weeks. It is essential that the closing and opening of the circuit should be made gradually to avoid shocks, and that the needles should be introduced so that they shall not come in contact with each other. If these rules are observed no evil results need be anticipated. Out of twenty-three cases related by Ciniselli, five were cured; and he states "that the mechanical action of the needles is combined with a chemical action produced by the electrolytic decomposition of water and of the salts of the blood."

DISEASES OF THE VEINS.

The diseases of the veins are, 1, inflammation; 2, varix; 3, hypertrophy; 4, atrophy; 5, degeneration; 6, phleboliths; 7, wounds; 8, air in veins; 9, parasites; 10, new growths.

These conditions will be briefly mentioned.

1. Inflammation.—This may be from within or from without, constituting in the former case Endophlebitis, in the latter Periphlebitis.

The chief cause of ENDOPHLEBITIS is a thrombus such as may occur in the later stages of phthisis, or as a sequela of the acute specific fevers.

PERIPHLEBITIS is set up by open wounds, amputation flaps, or direct wounds of veins. If there are bad hygienic surroundings, if overcrowding, if chronic kidney-disease, with the conditions mentioned existing, periphlebitis may result. The inflammation set up by a thrombus in endophlebitis leads to thickening of the outer sheaths of the veins, while the inner cells swell up and become numerous and active. Ultimately adhesion between the vein and the thrombus occurs, and this may terminate in the following ways :—

Liquefaction, the venous circulation being restored; permanent adhesion, the outer coat and the thrombus becoming continuous; the vein and the thrombus reduced to a state of fibrous tissue; or calcareous infiltration may ensue.

The inflammation set up from without—Periphlebitis—may be due to an open wound, ulcer, or abscess, the pus finding its way to the vein in sufficient quantity to cause a large abscess on its sheath. The result is, the nutrition of the vein is disturbed, with paralysis of the muscular fibres of the middle coat; cloudy swelling of the inner wall obstructing the flow of blood, leads to a thrombus.

The pus formed gradually finds its way to the surface, and escapes either by natural or artificial means.

Symptoms.—The symptoms of Endophlebitis are chiefly local. The vein becomes hard, swollen, and tender, the limb stiff, and darting pains shoot along the course of the vessel. If the inflammation attacks superficial veins its course can easily be detected by the eye if deep-seated, as when the chief venous trunk is involved, the whole limb becomes swollen, and phlegmasia dolens ensues. Should it be a smaller vessel, as the tibial instead of the common femoral, the part becomes hard and swollen, but without any great superficial œdema.

The constitutional symptoms in the cases alluded to may be slight; but, if pus forms, a change occurs. Pain becomes throbbing, constitutional symptoms of a typhoid character appear, with weak pulse, foul tongue, diarrhœa, delirium, and, in the great majority of cases, death. In fact pyæmia, in all its fatal character, supervenes on the suppuration of the veins.

Diagnosis.—Inflammation of the veins has to be diagnosed from inflammation of the lymphatics and erysipelas. In the former case the glands are enlarged from the commencement of the disease; the streaks are rosy red and numerous. In the latter there is a general blush.

Prognosis.—The prognosis is favourable except in the suppurative or pyæmic form, which generally ends fatally.

Treatment.—Absolute rest is essential in all the forms of phlebitis, and is obtained by fixing the whole limb by sand-bags or splints. Hot fomentations are pleasant, and allay pain. If pus is supposed to be forming, warm poultices must be applied, and an opening made where the abscess is apparent.

Medicines, as bark and ammonia and wine, are given to support the patient's strength. Calomel and opium are now abandoned.

2. Varix. In varicose veins the vessels are increased in length, diameter, and thickness.

The principal seats are the lower limbs; the body, when collateral circulation is set up by blocking of the venous trunks; the rectum (hæmorrhoids); the scrotum (varicocele).

Diagnosis.—The diagnosis is unmistakable.

Prognosis.—The prognosis is generally favourable unless complications result, and there is a tendency to rupture or inflammation. In both of these complications the result may be fatal.

Treatment.—The treatment belongs to surgery, but the indication is to find the cause of the varicosity, and if possible remove it. Support the limb by an elastic stocking or well-applied bandage. Operative interferences are attended with great risks from the danger of phlebitis or pyæmia being engendered.

3. Hypertrophy of walls of veins ensues when extra work is thrown on the vessels.

4. Atrophy may occur from disuse, as after amputation; the vessel shrinks, the calibre becomes diminished and finally disappears.

5. Degeneration. It is questionable if atheroma takes place in a vein.

6. PHLEBOLITHS are venous calculi. They consist of precipitated fibrin, and the less soluble salts of the blood. They are seen in veins where the circulation is slow, as in the veins of the prostate and bladder, or in varicose veins anywhere. They are considered of no particular moment, and do not require treatment.

7. Wounds of veins. After venesection gentle pressure is applied over the vein, and this leads to union in a few days, without as a rule any inflammation. No cicatrix results, and the vessel is not obstructed. Sometimes, but fortunately rarely, inflammation ensues, with suppuration and pyæmia.

8. Air in veins may cause death from arrest of the pulmonary circulation. This unfortunate result sometimes occurs in surgical operations.

Treatment.—The indications, according to surgical authorities, are to place a finger on the wounded vein, then (1) get the air out of the auricle; (2) to fill the auricle with blood; (3) to keep up a supply of blood to the brain. The first indication is fulfilled by keeping the finger on the vein during inspiration, and removing it

during expiration ; the second indication by applying friction to the limbs in an upward direction ; while, for the third indication it has been recommended to compress the abdominal aorta and the subclavian arteries, in order to ensure the passage to the brain of what little blood may be leaving the left side of the heart.

9. Parasites in veins are mentioned under *Bilharzia hæmatobia*. The embryos of *tænia* are sometimes found in the portal circulation.

10. New growths do not occur in veins, but the current may be stopped by tumours in the neighbourhood of the venous supply.

DISEASES OF THE DIGESTIVE SYSTEM.

In all diseases, as a matter of routine, the tongue is necessarily examined. Thus, it may be moist or dry, its size and colour may vary, and it may be abnormally clean or covered with epithelium or "coating." Valuable indications may thus be afforded as to the disease itself, the state of the system generally, and the progress towards recovery or the reverse. It is impossible, however, by its appearance to predicate what the disease may be, though it is useful to remember that the tongue is pale in general *anæmia* ; red as to its tip, edges, or papillæ, in subacute inflammatory stomach derangement. If covered with a thick fur, the stomach is similarly affected in its mucous membrane, whereas, if it looks raw, as in scarlet fever, the other parts of the gastro-intestinal tract are also involved.

The tongue may be the seat of local affections. Thus, simple ulcers, the result of gastric derangement, may form on the tip or frænum of the tongue. Ulcers may be of syphilitic origin, and if so, are usually situated at the sides of the tongue and inside of the lips. Sometimes syphilis forms oval patches, without any ulceration.

Treatment.—If the local affection is the result of gastric

derangement, attention to the diet and a mild purgative will generally effect a cure (F. 8); if of syphilitic origin, then the constitutional remedies for that disease must be put in force.

DISEASES OF PALATE AND FAUCES.

Inflammation of the palate or fauces may occur under several forms. Thus there is a variety called simple or catarrhal, commencing with bright red patches on the inside of the cheeks, and extending with considerable swelling until the whole surface may be covered. It is attended with a bad taste, furred tongue, and want of appetite. The mucous follicles, again, may be enlarged and obstructed, and when they soften and burst, as they usually do, small ulcers are left with some redness. This variety is termed "follicular." In infants, especially after some feverishness and restlessness, small yellowish-white spots on the lips, cheeks, or palate are seen. These are vesicles, which, bursting, leave small ulcerations. This form is called "aphthous." Two other varieties claim a few additional words.

PARASITIC STOMATITIS depends on the presence of a parasite, *Oidium albicans*. There are heat and pain in the mouth, and the disease is revealed by whitish-gray patches, looking like curdled milk and easily detached. It is peculiar to young infants, being known by nurses and mothers as the "thrush." Sometimes it appears in the later stages of phthisis in adults, and is a specially unfavourable symptom.

GANGRENOUS STOMATITIS, or CANCRUM ORIS, is a rare but dangerous affection, attacking weakly children recovering from measles or other acute disease. The ulceration commences on the mucous membrane of the lip or cheek, and spreads to the deeper tissues, perforating the skin, destroying the jaw, and leaving a hideous excavation with ragged gangrenous edges. It is noteworthy that pain and tenderness may be slight or altogether absent.

Swelling of the cheek, intense fœtor of the breath, great salivation, and rapid prostration with a fatal termination, accompany the local changes described.

Treatment.—In all affections of the mouth, chlorate of potass seems beneficial, given in two-grain to five-grain doses to children, but increased to twenty or thirty in adults (F. 7). Borax and glycerine may be applied locally in thrush; and, in cancrum oris, the only chance for the child depends on its being put under chloroform, and having the part burnt with strong nitric acid. The strength must also be supported by brandy and beef-tea, and the mouth should be freely washed with Condy's fluid or carbolic acid lotion.

MUMPS, CYNANCHE PAROTIDEA, is an acute contagious affection of the parotid and other salivary glands, the parotid especially being much swollen and painful to the touch. It is attended with some fever, and difficulty of opening the mouth and swallowing. The contagion of mumps in some cases seems to be very prolonged. One case lately came under my observation, where seven weeks elapsed before the disease occurred in a second member of the family. The disease extends over a period of four or five days and terminates in recovery, its declension being occasionally marked by swelling of the testicles or mammæ.

CATARRHAL TONSILLITIS is characterised by soreness of the throat, with superficial inflammation of the tongue and tonsils. It depends on cold, and is sometimes termed "sore" or "relaxed throat." It rarely ends in suppuration; recovery being effected in three to four days.

QUINSY, — *Synonym*, Suppurative Tonsillitis, — is attended with fever, fœtid breath, and pain in one or both tonsils, shooting along the Eustachian tube into the ear.

The tonsil or tonsils are red and inflamed, the inflammation terminating in resolution or progressing to suppuration, with speedy recovery following the discharge of pus.

It is caused chiefly by exposure to cold, and is most common in youth.

A form of chronic tonsillitis is not uncommonly seen in young and delicate children, where the tonsils are enlarged and the voice husky, with occasional deafness.

Treatment.—In MUMPS a saline mixture and a flannel bandage over the glands are alone requisite (F. 66). In QUINSY the inhalation of steam and the application of hot linseed-meal poultices hasten resolution or promote suppuration. Sulphate of magnesia (F. 24) can be recommended. The bowels having been freely moved, tincture of aconite 1 minim dose along with tincture of belladonna 2 minims, may be given every hour. These remedies sometimes cut short the inflammation, and the suppurative stage is not reached. Guaiacum is also said to assist the action of aconite (F. 6). In CATARRHAL TONSILLITIS a mercurial purge should be given (F. 23), followed by local applications of tannin and glycerine, or glycerine and tinct. ferri perchloridi. In chronic tonsillitis excision of part of the gland is sometimes necessary.

DISEASES OF THE ŒSOPHAGUS.

Acute inflammation may attack the œsophagus, constituting what is termed "acute œsophagitis," and may be due to extension of simple catarrhal inflammation of other parts; to direct injury from foreign bodies, or swallowing some corrosive poison; or it may be a complication of specific fevers, or cholera, or pyæmia. It is attended with pain, more or less severe, deep in the chest in the course of the œsophagus and with painful difficulty of swallowing and the vomiting of what has been taken, probably mixed with blood or membranous casts. There are also much thirst and great general distress.

The œsophagus may be the seat of stricture, either spasmodic or real, or of cancer.

These affections are all characterised by one prominent

symptom—difficulty of swallowing, with, in cancer, great pain, enlargement of the lymphatic glands, cough, and husky voice, from the pressure on the trachea or recurrent laryngeal nerves. Non-cancerous stricture is generally the result of swallowing some corrosive poison.

In attempting a diagnosis when the symptoms point to the œsophagus, it is important to look to the age and sex of the patient, to the presence or not of a cancerous cachexia, to the implication of other organs, and to the knowledge as to the seat of the stricture, if there is any, conveyed by an examination by the bougie. In forming a prognosis it is to be remembered that spasmodic affections of the œsophagus, though difficult to get rid of, are not fatal; whereas every form of obstruction is unfavourable, and in cancer a fatal termination may be foretold.

Treatment can only be palliative, unless in the spasmodic stricture of young and hysterical females, when the general treatment recommended in hysteria may be adopted. In spasm, friction with a belladonna liniment, the passage of a bougie, and careful dieting are essential.

INFLAMMATION OF THE STOMACH.

Synonym—Gastritis.

Inflammation of the stomach may be either acute or chronic.

Acute inflammation again is subdivided into (1) catarrhal, (2) erythematous.

Acute catarrhal gastritis is most common in middle or advanced life, and in females more than males. Sometimes it is seen in gouty or rheumatic people, or it may appear in connection with diseases of the heart or lungs or cirrhosis of the liver. Errors of diet, as taking cheese or indigestible food, may arouse acute gastritis. The chief cause is, however, alcoholic indulgence.

Acute erythematous gastritis is met with generally in children or young persons, and is sometimes called "gastric" and "remittent" fever. It is seen in some of

the eruptive fevers, as scarlet fever, and in the later stages of phthisis.

Pathology.—In catarrhal gastritis the stomach is found empty and contracted. The lining membrane is covered with thin mucus, which, when removed, reveals a congested surface with numerous small hæmorrhages or superficial ulcerations. The gastric tubes, on microscopic section, are seen to be distended with large granular cells. The solitary glands are greatly enlarged.

In erythematous gastritis, as seen in scarlet fever, the gastric tubes are distended with granular and fatty matters. The mucus is not increased, and the tubes are filled by an albuminous fluid instead of, as in catarrhal, with large granular cells.

Symptoms.—In the catarrhal form there is usually great weakness for a few days or hours, and occasionally the attack occurs suddenly. There is not generally much pain. Vomiting is always present, and constitutes a characteristic sign. The vomited material at first consists of the remains of a meal, and afterwards a thin glairy fluid is expelled with much retching. There is no appetite; bowels are confined; headache is severe. There is little increase of temperature, and the skin may be covered with perspiration.

In erythematous gastritis pain is the prominent symptom, unless the inflammation occurs with the eruptive fevers. The pain comes on after food, shoots down the shoulders, and is increased by pressure over the stomach, while vomiting is continuous, though a little mucus is all that is brought up. Thirst is troublesome. The tongue is at first red, afterwards dry and glazed. Diarrhoea of a foetid and unhealthy character accompanies the disease. The temperature is increased.

Diagnosis.—The vomiting may be mistaken for that which occurs with brain disease. It is distinguished from it by this, that the vomiting of brain disease is easy, and unaccompanied by nausea.

From typhoid fever it is distinguished by the rapid onset of the gastric symptoms; rapid, not gradual, rise

of temperature; and absence of eruption after the first week.

Treatment.—Rest to the stomach is essential. Hence no food should be taken for twenty-four hours. Ice may be sucked to allay thirst. If there is great exhaustion give nutrient enemata; if excessive pain, injectio morphinæ hypodermica. If there is evidence of indulgence in stimulants and of portal congestion, 5 grains of calomel may be placed on the tongue, and after an interval of eight hours a draught of effervescing citrate of magnesia should be given.

Vomiting is best relieved, if excessive, by iced champagne taken occasionally.

Warm poultices are gratefully received by patients with acute gastritis, and seem to give relief.

When food is considered necessary it must be given in the liquid form, as chicken soup or milk mixed with Vichy or Seltzer water, in small quantities and frequently repeated.

Chronic gastritis is simply a form of dyspepsia. The group of symptoms included under dyspepsia, with treatment, is referred to at page 268.

The stomach is also the seat of albuminoid disease, fibroid thickening, gangrene, softening, and diseases of vessels, but these are rare conditions.

GASTRIC ULCER.

Ulceration of the stomach is by no means an uncommon affection, and its existence was known to the ancient physicians, who laid down distinct rules for its treatment. In recent years zealous inquiries have been made as to the causation of the disease, the pathological anatomy of which is so peculiar.

Pathology.—It is a specific variety of ulcer. It is a distinct local lesion, and has only one analogue, viz. the corroding ulcer of the neck of the uterus. The *form* of the ulcer is that of a funnel. It seems punched out, and the edges may be bevelled off or thickened. The *shape*

is usually circular. The size varies from that of a pin's head to one-third of the mucous membrane of the stomach. It may be of all degrees from partial removal of the mucous membrane to perforation, and it may be, as observed on post-mortem examination, either open or else partially or completely cicatrised—the relative frequency of the two conditions being about equal. Its site is markedly more frequent on the posterior than on the anterior wall of the stomach, its exact location being in four-fifths of the cases upon a surface bounded by the posterior wall, the lesser curvature and the pyloric region. The rest of the surface of the stomach, while it is much larger, appears only to be affected in one-fifth of the cases. If situated on the anterior wall perforation more readily occurs, on account of there being no place for limiting adhesions, while if on the posterior, adhesions may take place to the pancreas, etc.; and thus, although the stomach is actually perforated, the adhesions prevent its contents passing into the peritoneum. It is worthy of note that by means of adhesions a communication may be set up between the stomach and colon, and thus faecal matters may be vomited with ease, not with difficulty, as in ordinary stercoraceous vomiting. The nearer the ulcer is to the coronary vessels, the greater the tendency to fatal hæmorrhage.

Etiology.—This ulcer, found only in the stomach or immediate neighbourhood, unattended by suppuration, and characterised by simple progressive molecular death, has suggested the explanation of its being caused by a corrosive action of the gastric juice, which could only occur under two conditions—(1) this gastric juice being either abnormally acid, or (2) the alkalinity of the wall of the stomach being abnormally diminished. These assumptions have been confirmed by the experiments of Pavy, who has found, if a certain quantity of acid is introduced into the stomach, and the circulation is left undisturbed, the stomach remains unaffected; but if with the same amount of acid the circulation is interrupted, the stomach becomes digested. If, moreover, the quantity

of acid is greatly increased without interruption of the current of blood, digestion will likewise take place.

The derangement of the circulation, so essential to the production of the ulcer, may be due to a variety of causes, all of which, according to Virchow, "act by interrupting the circulation in circumscribed portions of the wall of the stomach." Among these causes may be mentioned thromboses or emboli in diseased gastric arteries, and chronic hyperæmia of the mucous membrane.

Symptoms.—Painful intolerance of food is the chief symptom. The pain which is felt at the epigastrium varies in intensity, and appears within a quarter of an hour after food is taken, being increased by emotions or by pressure over the umbilical or dorsal regions, according to the situation of the ulcer. Vomiting of food in all stages of digestion, with or without blood, is a pretty constant symptom. The quantity of blood varies greatly, but when present in any quantity it is a most important sign. Constipation almost invariably accompanies gastric ulcer, and the patient has a worn-out, low-spirited aspect. Lastly, the failure of all remedies and the chronic history help us in forming our diagnosis.

The intensity of the symptoms varies more according to the position than the size of the ulcer, on account of some positions being more exposed to constant friction than others. If the ulcer be close to the pylorus, we may have stricture from spasm of the pyloric muscle, and thus the vomited matter will be in a sour and fermented state from its long retention in the stomach. Again, if the ulceration goes on to perforation, and no limiting adhesions have formed, the contents pass out of the stomach, and give rise to symptoms of acute general peritonitis.

The course of the disease is very chronic, lasting sometimes the greater part of a lifetime. It may occur at any age, tending more to cicatrization in the old and to perforation in the young.

This chronic course runs on to one of three terminations.

1. After long suffering, sometimes with relapses, the

patient gets better, owing to the ulcer cicatrising ; still, great care must be observed. This occurs in half of the cases.

2. Sudden death may occur from shock, owing to the ulcer perforating into the peritoneum, from peritonitis, or from hæmorrhage.

3. Gradual death, from sheer wearing-out. In such cases amenorrhœa or phthisis may supervene.

Treatment.—We have neither prophylactics nor specifics. All food should be given in very minute quantities and in liquid form. Hence milk, solution of beef, or soups containing white of egg, are most useful. In order to get the stomach to retain sufficient food, opium should be given by the mouth, so as to act as a gastric sedative during digestion. Collections of acid matter in the stomach may be counteracted by alkalies or alkaline saline mineral waters. If vomiting continues, we must have recourse to bismuth, dilute hydrocyanic acid (F. 9), creasote, or ice, and if all these fail, make use in time of nutrient enemata. Sulphate of soda, in the form of Carlsbad salts, is sometimes beneficial, when given early in the morning to empty the stomach. There is then less chance of vomiting when food is taken. In six typical cases of gastric ulcer lately under my care, beef-tea enemata were alone trusted to for nine days, iced champagne being given occasionally by the mouth. At the expiry of the time mentioned there was a cautious return (1st) to liquid, and (2d) at the end of a week to easily-digested solid food. The results were very satisfactory. When there is hæmatemesis, if not severe, ice, gallic acid (F. 19), or turpentine, may be tried ; but if much blood is being vomited, we should employ at once the “*Injectio Ergotini Hypodermica*.”

DYSPEPSIA.

The stomach is the natural receptacle of the food we eat and the liquid we drink. It starts on equal terms with other organs, but its powers of endurance are tried

more than those of any other organ. Into it are thrown the most heterogeneous compounds, and it is expected to do its duty satisfactorily, whether we lead the life of an anchorite or of an epicure ; or, if we go to neither of these two extremes, if we neither eat too plainly nor too abundantly, we may yet try its staying powers by the rapidity with which we swallow our food, or the length of time we allow to elapse between meals.

An organ tried so much naturally rebels, gets out of gear, and sooner or later dyspepsia or indigestion supervenes, and the whole body sympathises with its ailments. The mind becomes clouded, and the temper peevish, bodily vigour is impaired, and life is rendered not a pleasant holiday, but a sour and angry fact. Dyspepsia has many symptoms, and a brief consideration will be given to the most prominent of these, and how they may be met.

Want of Appetite may depend on mental causes, as joy, anger, or anxiety, or it may appear without any apparent cause. Common sense must dictate how to deal with the former cause, and, for the latter, an acid or a bitter infusion may be employed (F. 10).

Nausea and Vomiting.—Nausea after taking food, which may or may not terminate in vomiting, sometimes attracts attention—the vomited matter being sour at first, but, if the vomiting be long continued, mixed with bile. To soothe this irritability there are special therapeutic remedies, such as creasote and hydrocyanic acid (F. 9), in addition to careful regulation of the quantity and quality of food.

Flatulence and Belching.—Flatulence, popularly termed “the wind on the stomach,” may be due to many causes, prominent among which are the fermentation of food or the want of an accustomed meal at a certain hour.

It is often relieved by warm carminatives (F. 13), and by a regulated interval between meals. If it immediately follows the taking of food, pepsine and rhubarb are useful (F. 91).

Should belching be accompanied by a rotten-egg flavour, showing the evolution of sulphuretted hydrogen gas, creasote and charcoal biscuits should be ordered; if there is also great acidity, prescribe sp. ammon. aromat., liq. pot., and tinct. rhei (F. 73).

Pain.—Cullen described two kinds, cardialgia or heart-burn, and gastrodynia or cramp or spasm of the stomach. For simple heartburn black sugar or eating an apple are popular but good remedies; or we may give a draught of liquor bismuthi and spirit of chloroform, or (F. 11). Gastrodynia Dr. Abercrombie thought was due to a loaded colon, and hence ordered a brisk purgative, followed by carminatives (F. 25, 13). A mustard poultice often gives relief.

Water Brash, Pyrosis, attended with the eructation of thin tasteless watery fluid, may be connected with organic disease of the stomach, or with the taking of some particular kind of food, as oatmeal. If we treat it simply as a symptom, pulv. kino co. can be recommended, combined with a watery purgative in the morning, as Friedrichshall or Püllna.

In 1842 John Goodsir discovered in the vomited matters of certain patients small flat bodies having a rectangular outline and a somewhat oblong shape, and resembling little packets tied lengthwise and across with a string; hence he called them *sarcinæ* (bundles). They are the cells of a fungus, and are evidence that the stomach is prevented by disease from completely emptying itself. Sulphite of soda given in 20 to 60 grain doses relieves, by the sulphurous acid being set free in the stomach, what probably is an incurable disorder.

Dyspeptics constantly ask, What shall we eat, and what shall we drink? and, although no fixed rules can be laid down, the following points are of practical importance.

Mutton is probably the most digestible of all animal food, while all cured meats—ham, tongue, and sausage—are indigestible. Animal food is more easily digested than vegetable. While man's organs of digestion ally him

more to the carnivorous than the graminivorous race, yet a mixture of animal and vegetable food suits the stomach best. Do not press prohibitions as to food too far, else you will convert the dyspeptic into a confirmed hypochondriac.

Interrogate the patient as to his own sensations with regard to liquids, as no definite rule can be given. Beer agrees with some, sherry or claret with others. Many men can be total abstainers with impunity, but there are many others who require whisky or brandy with meals. The idiosyncrasies of each individual case must thus be duly considered in regulating the dietary of the dyspeptic.

DILATATION OF THE STOMACH.

An acute and a chronic form of dilatation of the stomach are recognised.

The former, acute, is very rare, only a few cases having been reported and these only during the last few years.

Dr. Fagge states that the diagnostic points of this affection are :—

1. A rapidly increasing, unsymmetrical distension of the abdomen—the left hypochondrium being full, while the right is comparatively flattened.
2. The existence of a surface marking descending obliquely towards the umbilicus from the left hypochondrium, and corresponding with the dragged-down lesser curvature of the stomach, this line appearing to descend with inspiration.
3. The presence of fluctuation in the lower part of the abdomen.
4. The occurrence of splashing when the lower part of the abdomen is manipulated.
5. The presence of a uniformly tympanitic note over a large part of the distended region when the patient lies flat on his back.

Treatment.—Empty the distended stomach with the stomach pump, and sustain life by nutrient enemata.

CHRONIC DILATATION.—This condition is caused by

the digested food being prevented from entering into the duodenum. As a rule, there is (1st) stricture of the pyloric orifice the result of cancer, either as a hard scirrhous ring or projection of a fungoid growth: (2d) there may be stricture, non-malignant, due to fibroid thickening; or, in some rare cases, thickening of the mucous membrane alone may cause contraction: (3d) the cicatrization of a simple ulcer near the pylorus may cause obstruction: (4th) tumours, generally malignant, may press on the opening: (5th) the stomach may be displaced by adhesions, and the pyloric orifice dragged downwards, till dilatation of the organ results: (6th) the stomach may be dilated by paralysis of the muscular coat due to injury of the splanchnic nerves; or a certain amount of dilatation may follow on chronic gastritis.

Anatomical Characters.—When the abdomen is opened in a case of death from dilatation of the stomach, the organ is found to be greatly enlarged, and seems to fill the whole cavity. The greater curvature lies below the pubes. The position of the pylorus varies according to the disease affecting it. It may either be tied down by adhesions to its original site, or dragged from its natural position by the weight of the organ. When laid open the stomach seems filled with dark-coloured frothy fluid. The rugæ are effaced by constant stretching, and the mucous membrane is more or less softened by the *post-mortem* changes effected by the acid contents. Microscopically the tubes may be found widely separated or altogether destroyed; the gastric cells may be large and fatty; or the muscular structure may be, notably at the pylorus, in a state of hypertrophy.

Symptoms.—The symptoms are gradual. There is usually a history of long digestive derangement, acid eructation, and vomiting. This latter symptom is very constant, but the vomiting does not occur, as in gastric ulcer, soon after taking food, but at long intervals, most frequently at night or towards the morning; occasionally it is attended with hematemesis. The character of the vomited matters, which are brought up easily and without

strain, are peculiar, of a dark-brown colour, and very acid. On standing, they become covered with a scum, and a thick brown sediment settles. This sediment shows, by a microscopic examination, sarcinæ and torulæ, intermixed with food and mucus. The bowels are always constipated, the urine thick and depositing lithates. The nutrition of the patient suffers, and death takes place from exhaustion, preceded by swelling of the legs and feet.

Physical signs.—A large extent of tympanitic sound; irregular distension of the abdomen; fulness of the left side of the abdomen and vermicular motion apparent over the organ. The character of the vomiting and the detection of sarcinæ under the microscope, the history of the case and the age of the patient, must guide the practitioner as to the cause of the dilatation.

Treatment.—The main point is to restrict food, and to have a diet free from sugar and starch—thus gluten bread with lime water and weak coffee with no milk or sugar for breakfast; soup for dinner, fish, mutton, or chicken with no vegetables. Cod-liver oil may be given; nutrient enemata and washing out the stomach with Vichy or Carlsbad water are sometimes serviceable. To relieve constipation we may give enemata of gruel and warm water, and aid their action, if necessary, by castor oil or turpentine. The pain if present is abated by the subcutaneous injection of morphina, or a mixture of hydrate of chloral and bromide of potassium. Acidity is corrected by bismuth, soda, and magnesia; or *Mistura Creasoti*; or carboic acid in 2-grain doses; or, according to Sir William Jenner, by hyposulphite of soda.

CANCER OF STOMACH.

Cancer has a partiality for the orifices of the stomach, being most common at the pylorus. When in that situation, it is usually fungating or villous, of the scirrhus type, and may be associated with cancer elsewhere—especially of the liver. When at the cardiac orifice, the cancer is always of the epithelial type, and frequently

extends up the œsophagus. The body of the stomach is very rarely affected without the orifices. Under the age of thirty cancer of the stomach is rare. The average of 600 cases was, according to Brinton, fifty years. Sex appears to have no influence in its production.

Symptoms.—Vomiting and pain are pretty constant symptoms. When the pylorus is involved, the vomited matter is frothy and fermented, containing sarcinæ, and the pain comes on some time after taking food. If the cardiac orifice be the seat, the vomited matter contains blood altered by the secretions ("coffee-ground vomit"), and the pain comes on immediately after taking food, and is very lancinating. In either case the vomited matter may contain cancer elements.

Loss of appetite, great emaciation, with the general cancerous cachexia, are prominent symptoms, the latter being well marked. The physical examination is most important. A hard, uneven, immovable tumour is felt an inch or two below the liver to the right side, although it may be dragged to the left. When the pylorus is affected, the stomach is large and distended. The percussion is tympanitic, and Hippocratic succussion may be developed from the presence of fluid food and air. By grasping the stomach, we limit the motion of the fluid; and thus the size of the stomach may be seen, as well as an exaggerated peristaltic motion giving sometimes an hour-glass appearance, and beginning at the left hypochondrium.

The bowels being to a great extent empty, undue prominence of the epigastrium is a not uncommon sign.

The duration is important, as it never exceeds two years.

Diagnosis.—The following points are of practical importance in distinguishing cancer of the stomach from simple gastric ulcer. The cachexia, the constant pain, the occurrence at middle life, and, more important than anything else, the detection of the tumour by physical signs, are characteristic of cancer; while a youthful age, the female sex, copious hæmatemesis, non-detection of cancer-

ous elements in the vomited matter, and a paroxysmal localised pain, are peculiar to gastric ulcer. Further, chronic dyspepsia or chronic gastric catarrh differs from both in its history, its longer continuance, the absence of hæmatemesis and great emaciation, and the fact of the pain being neither persistent nor circumscribed.

Treatment can be only palliative and supporting. Food should be given in small quantities, and—if it is pyloric obstruction—of such a kind as not to add to the discomfort by its tendency to ferment. Hence animal food is appropriate. Stimulants will often be required, and of these the effervescing ones, as champagne, are best. Laxatives are necessary. In some cases complete emptying of the organ by the “stomach-pump,” and then regulating the diet, does good, or, as a last resource, feeding by the rectum. The vomiting may be controlled by morphina or ice, and the former will be frequently required for relief of pain (F. 71). Condurango bark has been greatly advocated of late (F. 8a).

OBSTRUCTION OF THE BOWELS.

If obstruction of the bowels is diagnosed, it is the first duty of the practitioner, if possible, to elucidate the cause. Naturally he will investigate and make certain whether or not it is due to hernia, and act accordingly. If he fail to discover any hernial strangulation at its most common sites, the obstruction may be considered dependent on one of three great divisions, which are, according to Dr. Haven:—

1st, Intermural, where, as the name implies, the mucous and muscular coats of the intestinal walls are involved.

a. Cancerous stricture.

b. Non-cancerous stricture. Comprising—

1. Contractions of cicatrices following ulceration.

2. Contractions of walls of intestines from inflammation, non-cancerous deposit, or injury.

c. Intussusception.

d. „ associated with polypi.

2*d*, Extramural, or those causes acting from without, or affecting the serous covering.

a. Bands and adhesions from effusion of lymph.

b. Twists or displacements.

c. Diverticula.

d. External tumours or abscesses; diaphragmatic, omental, or obturator hernia.

3*d*, Intramural, or obstructions produced by the lodgment of foreign substances.

a. Foreign bodies, hardened fæces; or, should the obstruction be due to cancerous stricture, the sigmoid flexure of the colon or rectum is usually affected, and, in addition to the obstruction, there will also be evidences of the cancerous cachexia.

The condition known as intussusception is not uncommon in children, and is similar to what occurs when the finger of a glove is pulled within itself. The most common invagination is ileo-cæcal—that is, the passage of the ileum and cæcum into the colon preceded by the ileo-cæcal opening. It occurs most frequently in children, and, on account of the greater mobility of the colon at that age, the invagination often makes its way in a few days through the whole colon, and appears in the rectum immediately above the anus, through which it is even occasionally prolapsed. Violent colic followed by vomiting is the first symptom. Next comes, through increased peristaltic action, acute diarrhoea with bloody stools, these bloody stools being peculiar to this acute form of intestinal obstruction. Acute tenesmus and paralysis of the rectal sphincter are later phenomena. The course of such invaginations in children may be acute, and lead to complete occlusion and death in from three to six days, or in a few hours from shock. In other cases, and especially in adults, separation and gangrene of the intussuscepted portions may take place gradually, and the fatal termination may not occur until the second or third week. Or the course may be chronic, the swelling may disappear, and, the canal of the intussuscepted portion becoming permeable, the fatal termination may

be delayed with alternate diarrhoea and constipation for a year. A more fortunate result is when, spontaneously or by suitable treatment, the invaginated part is withdrawn into its normal position without separation.

Should the obstruction be due to bands or twists, the lower part of the ileum is the most frequent seat.

Symptoms.—The principal symptoms of all forms of complete obstruction of the bowels, with the exception contained in the preceding remarks, are—

1st, Vomiting, ultimately becoming faecal.

2d, Pain, varying in severity.

3d, Increasing tympanites.

4th, Hiccup and constipation.

5th, Inflammatory signs, as alterations on the pulse and temperature.

Vomiting will naturally be most marked and early when the obstruction is situated at the upper part of the intestine; and, if the condition is unrelieved, death will occur in five to ten days. If, however, it is situated in the colon, the end may be delayed for weeks. Sometimes, by carefully feeling the abdomen, the point of obstruction can be detected by increased fulness and diminished resonance over this particular spot. Besides this, hyperdistension is seen above, and diminished distension below, the obstruction. This is most marked when the obstruction is low in the bowel, and the gradual filling above it may be observed by the coils of intestines sometimes marking themselves against the abdominal wall.

Treatment.—At first, when the diagnosis is somewhat uncertain, castor oil or an enema may be given, but neither should be continued if it becomes clear that there is a mechanical hindrance to the passage of faeces. The two principal points then are,—to sustain the strength of the patient by means of beef-tea and milk, and to relieve the pain by opium and hot fomentations. Ice should always be given freely to allay thirst. Opium may also do more than relieve pain. It stops vomiting; it arrests violent and useless peristaltic action; it favours

the accumulation of liquid contents above the obstruction, and by the combination of these factors it may aid in effecting a cure. To adults it must be given until slight narcosis is produced. Brinton says it is inadvisable to stop all peristaltic action, and suggests as a happy compromise the combination of opium with belladonna—ext. of opium 2 parts, with ext. of belladonna $\frac{1}{2}$ part. In cases of intussusception in children, when the prolapse is perceived in the rectum, reduction should be attempted under anæsthesia as early as possible by the hand or the sponge sound, and followed by injections of water and air after the previous reduction has preceded as far as it possibly can, viz. into the lowest part of the sigmoid flexure. If invagination is fixed and chronic, or if there are signs of gangrene, prudence forbids all attempts at reduction. Thus calling time to our aid by the means indicated, nature may, in her own way, remove the obstruction, unless, of course, it is due to an irremovable cause.

At an early stage, before there is any possibility of gangrene having set in, the patient may be placed on his back, with his pelvis raised, and a long stomach-pump tube inserted into the rectum as far as it will go without force. Then warm water should be slowly thrown up until the bowels become distended. When this occurs the coils of intestine should be moved on one another by the hand placed on the abdomen. In this way, or by means of air instead of water, cases have been successfully treated; and besides, we can by this means form an idea of the position of the point of obstruction by the amount of water capable of being thrown up.

In some cases it is necessary to nourish by stimulating enemata.

Should gastrotomy be resolved on, the advice of a surgeon ought to be obtained; but we should keep in mind, however, before resolving on this, that not a few cases are spontaneously cured by nature in ways with which we are not well acquainted.

PERITONITIS.

The peritoneum or serous membrane lining the abdominal and pelvic cavities and investing the viscera, may suffer from acute or chronic inflammation. The pathological changes are precisely similar to those which occur in all serous membranes, viz. capillary congestion, redness, more or less loss of polish, and exudation resulting in a thin grayish lamina, which ultimately becomes thicker and either ribbed or villous according to position. The surfaces of the intestines are injected, and they are slightly glued together with soft yellow-gray lymph stretching from one fold of the peritoneum to another. In the pelvic cavity there is turbid fluid, in which float flakes of lymph. The effused fluid is chiefly observed in chronic cases, and tends naturally to gravitate to the lower and more dependent parts, *e.g.* into the pelvis and lumbar regions, where it may escape observation ; or, if excessive, it may distend the abdominal walls. This fluid may be clear or bloody, or become rapidly or slowly purulent.

Peritonitis, even though of local origin, tends to spread until the whole of the peritoneal surface is involved ; and convalescence, should it occur, is attended with absorption of the fluid, organisation of the false membrane, thickening of the peritoneal surface, and adhesions of adjacent organs. Should the fluid be purulent, it may form an external abscess or escape into the intestines.

Causation.—Peritonitis is occasioned by injuries, hernia, perforations, and extension of disease from neighbouring parts ; it is also the result of various blood diseases, as puerperal fever, tubercle and Bright's disease ; sometimes it is acute and idiopathic, from exposure to cold and wet.

Symptoms.—In the acute form, however occasioned, the symptoms are marked by fever, and with the fever there is pain in the abdomen, increased on pressure or by the slightest movement. The patient lies in bed with the legs drawn up. The face is anxious and pinched, and

the abdomen is tympanitic, tense, and hot. Vomiting is often present and naturally aggravates pain. The urine is scanty and high-coloured, the pulse is rapid, hard, and wiry, the tongue parched, and the respiration quick and shallow. Should the disease take a favourable turn, the gravity of the symptoms abates, the fever diminishes, and the pulse becomes normal. If, on the other hand, a fatal issue is to result, the abdomen becomes distended, the pulse thready, the extremities cold, and collapse sets in, with or without loss of consciousness. Death may occur as early as the second or third day, or it may be delayed for a week.

Treatment.—This consists in enforcing absolute rest, and maintaining the position which is instinctively assumed, at the same time guarding the patient from the unnecessary weight of the bed-clothes by means of a cradle. Should the disease be idiopathic and seen early, leeches should be applied to the abdomen and the bleeding encouraged by hot fomentations. Opium should also be given by the mouth from $\frac{1}{2}$ to 1 grain every two hours, or by the rectum in the form of enema.

The old plan of combining calomel with opium is to some extent abandoned. Yet it has much to recommend it, for any other treatment in this grave disease seems only palliative and expectant. If the mercurial treatment is resolved upon, it should be pushed until slight salivation appears.

Belladonna I once found successful given in $\frac{1}{4}$ grain doses of extract every two hours until physiological action manifested itself. To relieve tympanites, enemata of turpentine are valuable, or, in extreme cases, puncturing of the distended intestine is still in force. Hiccup is a distressing symptom and calls for ether and narcotics, or a combination of chloral hydrate, bromide of potassium, liq. morph. hydrochlor., and potass. bicarb., or injectio morphinæ hypodermica used in such quantities as will ensure relief from the pain.

The strength must also be sustained by liquid nourishment—beef-tea, eggs, and milk. In very acute cases an

ice-bag over the abdomen, with two or three layers of flannel between, is very useful. If perforation is suspected, abstinence from food and stimulants, and nourishment by enemata, are indicated. Ice to suck is very grateful and mitigates vomiting. Treatment by blistering has been advocated, but the inflammation is too general to recommend its being adopted.

CHRONIC PERITONITIS

sometimes follows the acute form ; generally, however, it is an independent affection, associated with the strumous diathesis. Numerous miliary granules lie within or immediately beneath the membrane, especially in the folds of the peritoneum which compose the omentum. When there are symptoms of chronic peritonitis, with evidences of a strumous constitution and no history of a previous acute attack, Louis seems to think that these granules will always be found.

Symptoms.—These are obscure, and steal on the patient in a very insidious manner. Usually pricking pain is experienced in the abdomen, and the belly gets full and tense. The pain is increased on pressure. There are also loss of appetite, nausea, fever, progressive emaciation, and diarrhoea. After a time the effusion of fluid takes place, the abdomen enlarges, and fluctuation is felt. With this tubercular peritonitis there are often combined disease of the mesenteric glands, phthisis, etc. The fluid does not gravitate so freely on account of adhesions, and this condition, with the thickening of the peritoneum, serves to distinguish this affection from ascites. Another useful sign, when it can be detected, is friction sound, heard by the ear or through the stethoscope, and produced by respiratory movements of the abdominal walls. *Tabes mesenterica* is a name given to a tubercular or strumous degeneration of the mesenteric glands, and is by some termed “abdominal phthisis.” It is peculiar to young children of a strumous diathesis, and presents features very similar to those previously mentioned.

There is always more or less pain in the belly, and to ease this the child instinctively draws up its legs. The abdomen, in a fully developed case, is tense and swollen, and the veins over it are seen to be distended. The body is thin and wasted, the appetite capricious, the bowels relaxed, and the motions sour-smelling. The evening temperature is increased, and the disease ends fatally, either by exhaustion or through the lungs becoming also the seat of tubercle.

Treatment.—Mild nutritious diet—milk, beef-tea, etc.; iodine ointment applied externally; while internally syr. iod. ferri and cod-liver oil must be administered. These cases are very unpromising, and, unless chronic peritonitis is the consequence of the acute attack, not much benefit will ensue from any form of treatment. Opium fomentations, or even blistering, may be used if the severity of the symptoms indicates their propriety.

In *tabes mesenterica* the treatment is similar to that recommended under *Tuberculosis*, but the prognosis is necessarily gloomy if the disease is well established.

TYPHLITIS AND PERITYPHLITIS.

In the right iliac fossa lie the cæcum and its appendix, only anteriorly and laterally covered by peritoneum. Inflammation not unfrequently attacks this particular part of the intestine, and if the inflammation affects the mucous surface and the coats of the cæcum, it is termed typhlitis (*τυφλός*, blind; *terminal itis*); while, if the areolar tissue connecting the cæcum to the psoas and iliacus muscles is also involved, the term perityphlitis is employed.

Various causes may originate the inflammation. Thus concretions may accumulate in the vermiform appendix, or bits of bone, pins, bristles, etc., may stick there, or any of the intestinal ulcers may perforate the bowel at the place mentioned. Should the perforation occur where the bowel is free from peritoneal covering, fecal matter escaping directly into the surrounding tissues leads to

inflammation and abscess, which may take a varied course. Thus it may open into the rectum, or form a swelling in the groin, or pass downwards along the psoas and iliacus muscles to point at the upper part of the thigh. In the majority of cases, however, it presents itself in the iliac region in the position which the cæcum usually occupies, whence it may be discharged either by one of the ways previously alluded to, or it may again enter the cæcum by its original orifice, or a series of sinuses may be formed, which never entirely close.

Should perforation take place directly into the peritoneal cavity, fatal peritonitis will of course result.

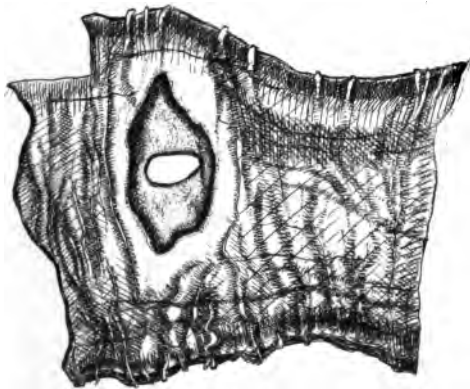
Symptoms and Progress.—The early symptoms are pain and tenderness in the iliac region, rigors and fever. The patient lies on the right side with legs drawn up. If the abscess forms and extends downwards, the symptoms are obscure; if it tends to point anteriorly, the fulness and hardness become more pronounced, and the contents may be discharged into the bowel, or externally by an artificial anus. Should the discharge be into the peritoneum, the local symptoms of pain and tenderness will not be confined to one particular spot, but be general over the abdomen, occasioning great suffering and death in a few hours.

The duration of typhlitis is uncertain, sometimes ending in speedy recovery, or in death from a lingering and obscure illness.

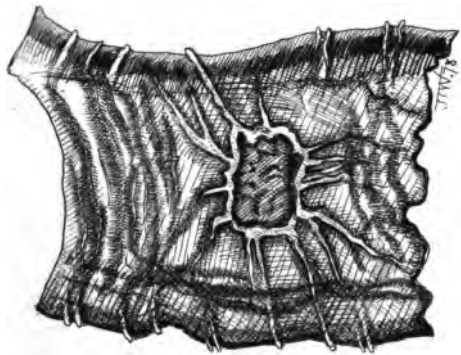
Treatment.—Locally, leech and apply hot fomentations or poultices. Internally, avoid giving drastic purgatives. Keep the bowels quiet with opium in any of its forms. Give only liquid food, and allow wine or brandy, should exhaustion or suppuration appear.

Should the bowels not open naturally, castor oil may be taken if enemata fail.

INTESTINAL ULCERATIONS.—The ulcers characteristic of typhoid fever and dysentery have already been described under these diseases. The bowel may, however, become the seat of ulceration of a non-specific character, as the result of inflammation from various causes, as foreign



*SIMPLE ULCER OF INTESTINE.
LIMITED IN AREA, PUNCHED OUT APPEARANCE.
TERMINATING IN PERFORATION; PERITONITIS.*



*TUBERCULAR ULCER OF ILEUM.
WALLS COMPOSED OF RUGAE GATHERED INTO A HARD
CIRCULAR KNOT, CENTRAL AREA ERODED FORMING FLOOR.*

bodies, calculi, hardened fæces, etc.; or the ulceration may be specific and associated with tubercle. The latter variety, tubercular ulceration, is frequently observed in scrofulous children, while if seen in adults it is generally secondary to pulmonary phthisis. Tubercular ulcers affect chiefly the lower portion of the small intestine, and gradually cease towards the jejunum. Their position is transverse as regards the bowel, the margins and floor are thickened; sometimes imperfect cicatrisation may be observed, the edges being drawn together and leading to contraction of the gut and even stricture. The characteristics of the simple and tubercular ulcer are seen in the engravings.

INTESTINAL WORMS.

Of the different intestinal worms which inhabit the human body there are two great varieties—the hollow worms and the solid worms. In the first class we find three species of *tænia*, the most common being the *Tænia solium*. Its length varies from two to ten yards or more, and its habitat is the small intestine. It consists essentially of a head and segments. The head is about as large as a small pin's head flattened, with a double circle of hooks, around which are four suckers or mouths by which it attaches itself to the intestine. The segments, joints, or *proglottides*, are rectangular, and possess male and female organs opening into a common aperture retaining the ova, which, when ripe, contain a six-hooked embryo. The joints are at first more broad than long, but as they diminish in distance from the head they become smaller and smaller, and the length exceeds the breadth. The *Cysticercus cellulosæ*, a parasite chiefly resident in pigs, seems to be the parent of the *Tænia solium* in man, and from uncooked or improperly cooked pork the tapeworm is developed in the human body. How does the tapeworm develop in the human body? The answer to this inquiry and explanation of the statement preceding it is as follows:—Segments containing abundant ripe ova are passed per anum and scattered

about in various ways, and so are swallowed by animals, notably pigs, oxen, and sheep, mixed with their food. In the alimentary canal of these animals the shell bursts, the embryo escapes, attaches itself to the mucous surface, works its way into the tissues, and when it reaches a suitable spot, still further develops and presents a head and neck with a vesicular or bladder-like appendage. In this stage the worm is termed *cysticercus* or bladder-worm, and may be seen in the muscles, liver, and brain of various animals. If the *cysticercus* thus existing in the flesh of animals is permitted to enter the alimentary canal of a human being, it becomes attached by its head, the vesicle falls off, and a succession of segments form, constituting the ordinary tapeworm.

Symptoms.—The only phenomenon which seems to indicate the presence of the parasite is the appearance of segments in the *fæces*. Sometimes the victims of *tænia* also complain of pain in the belly, unsatisfied appetite, thirst, great depression of spirits, and itching of the anus or nose.

Varieties.—*Tænia mediocanellata* resembles very much the former variety, but it has only a sucking apparatus in the head, and no hooks. It appears to result from the further development of a *cysticercus* infecting cattle, and owes its introduction into the system to the eating of improperly cooked beef.

The *Bothriocephalus latus*, peculiar to Switzerland, Russia, and Poland, is the largest of all the tapeworms, sometimes attaining a length of twenty-five feet and upwards, each foot containing a hundred and fifty segments or joints, and each joint having its own male and female organs. The head is club-shaped with a longitudinal slit, by which it attaches itself, but it possesses no suckers.

Treatment.—When the presence of the worm has been discovered, the best way to expel it is to tell the patient to take no food for eight hours, then to administer in the evening *xxx* m. of the ext. of male fern in a draught of peppermint water. Follow this up in the morning

with a dose of castor oil, and about midday by a large plate of mashed potatoes. The head and segments will probably be thus forced away; if not, let the same treatment be adopted on a subsequent occasion (F. 29).

The bark of the pomegranate root, or kousso, or oil of turpentine, are all well-known anthelmintics, but are inferior to the male fern.

ROUND WORMS

possess a distinct integument and an alimentary canal, with a mouth at one end and an anus at the other. The sexes are always separate. The genital pore is usually near to the anus, and in the female is about the middle of the belly.

1st, *Ascaris lumbricoides*, the common round worm, resembles much the common earth-worm. The female is nearly twice as large as the male. Its habitat is the small intestine, generally of badly-fed children, but from this it may creep upwards to the colon or to the stomach, and it has also been found in the nose, and in the hepatic or pancreatic ducts. Authentic records indicate that a large number of *lumbricoides* may be in the body at the same time. As a rule, however, they rarely exceed five or six. They may penetrate the intestinal wall to the peritoneum, causing an abscess near the umbilicus. The symptoms are obscure and various. Generally speaking, there are thirst, disturbed sleep, fever, depraved appetite, and itching of the nose and anus.

Treatment.—The best remedy is *santonin* given in doses of one to three grains twice daily to a child, or double that quantity to an adult. Turpentine may also be given, or *kamala* and *kousso*, or the powder of male fern with other purgatives (F. 30).

2d, The common thread-worm (*Oxyuris vermicularis*) is small, white, and thread-like, the female being about a third of an inch long, the male about half that length. They exist in the colon or rectum, generally in great numbers at a time, and infest children who are badly fed

or are in indifferent health. The chief symptom is itching at the anus or at the nose, with bad breath and generally indifferent health. The diagnosis can easily be confirmed by observing them in the *fæces*.

Treatment.—Enemata of cold water, infusion of quassia, tea, or liq. calcis, repeated daily, are sufficient to kill the oxyurides, with occasional doses of hydrarg. c. creta. For adults, perchloride of iron, half an ounce to a pint of water, is recommended as an enema. Dr. Cobbold prefers moderate doses of aloes and asafœtida followed by mineral waters, as Püllna, Friedrichshall and Hunyadi Janos, to other treatment in thread-worms.

The whip-worm (*Trichocephalus dispar*) and the *Sclerostoma duodenale* are rarely seen in this country, although the former is sometimes observed in people who have died of typhus or of enteric fever.

PENTASTOMA (πέντε *five*, and στόμα *a mouth*).

A genus of entozoa belonging to the family *acaridæ*. "The species," according to Dr. Cobbold, "two of which are liable to infest man, have a ringed or segmented body, the head being surrounded with four large hooks or claws, arranged in pairs on either side of the mouth. The *pentastoma denticulatum*, infesting the liver, gives rise to no functional disturbances. It is the larval condition of a worm that infests the nasal cavities of the dog—*pentastoma tænioides*."

"*Pentastoma constrictum*, the other human pentastome, infests the liver and lungs. In length it measures half an inch to an inch, being also recognised by the presence of twenty-three rings. From its large size it may produce serious and even fatal symptoms. The entozoon occurs in Africa, and attacks European residents in the West Indies."

TRICHINA SPIRALIS—TRICHINOSIS.

The *Trichina spiralis* is met with in the muscular

tissue in the form of a minute worm, which lies coiled up in the interior of an oval cyst, giving to the naked eye an appearance like minute white grains. These trichinæ are discovered chiefly in the flesh of pigs, and it is from the use of trichinous pork that man has become affected. Pigs again, it is supposed, obtain the disease from rats. The trichinæ cysts are dissolved by the gastric juice, and the parasites set free. Sexual maturity is developed; the ova and the living embryos at once commence active migration, finding their way into the small vessels or lymphatics of the bowels, and thence they are conveyed over the body. In this way they enter the intestine, irritating it in their passage, getting to the intermuscular tissue of the trunk and limbs, and thence penetrating the muscular tissue and destroying it.

Symptoms.—The symptoms attending trichinosis in severe cases are somewhat typical. There is first intestinal disturbance, not unlike that of typhoid fever, with coated tongue, diarrhoea, and great prostration. If fever exists, it is but slight, and accompanied—even from the first—with a remarkable increase of perspiration. Secondly, there is also so-called “muscular lameness,” followed by muscular inflammation, pain, and tenderness not unlike rheumatism, with stiffness and rigidity over the voluntary muscles. On the seventh day the diagnosis becomes easier, for there is œdema of the face and eyelids, and this œdema is not attended with albumen in the urine, thus excluding any suspicion of the kidneys being implicated by Bright’s disease. The further progress of the disease is marked by general prostration, attacks of dyspnoea, hoarseness, profuse sweats, and sleeplessness.

It is difficult to form a positive prognosis in any single case of trichinosis, for its severity, duration, and termination depend upon the number of trichinæ introduced into the system by the meat eaten, and this again varies with its mode of cooking. The less thoroughly the meat is prepared, and the less it is exposed to heat, the more severe will be the illness, and a more unfavourable prognosis will also extend to those cases where the early symptoms are

violent than when they are mild and long delayed. Long-continued diarrhoea and pre-existing disease are especially unfavourable. In some cases recovery may take place in a month, in others it may require three or four. In some outbreaks the mortality is small, in others it is as high as 25 per cent, and death may result from peritonitis, pneumonia, or debility.

Treatment.—We can only treat symptoms, as we know of no remedy specially adapted to kill the parasites. A common-sense prophylactic precaution is to avoid raw or underdone pork or German sausages.

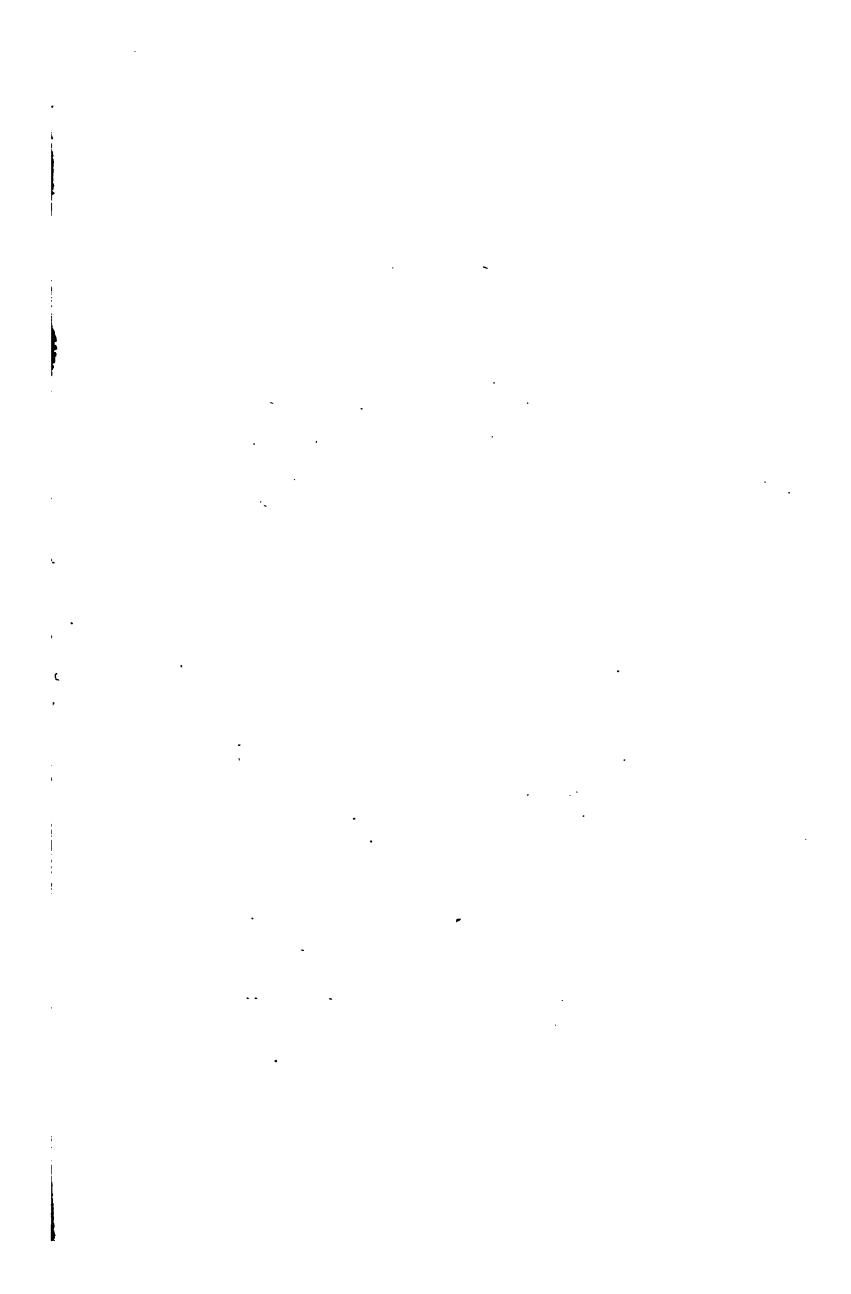
DISEASES OF THE LIVER.

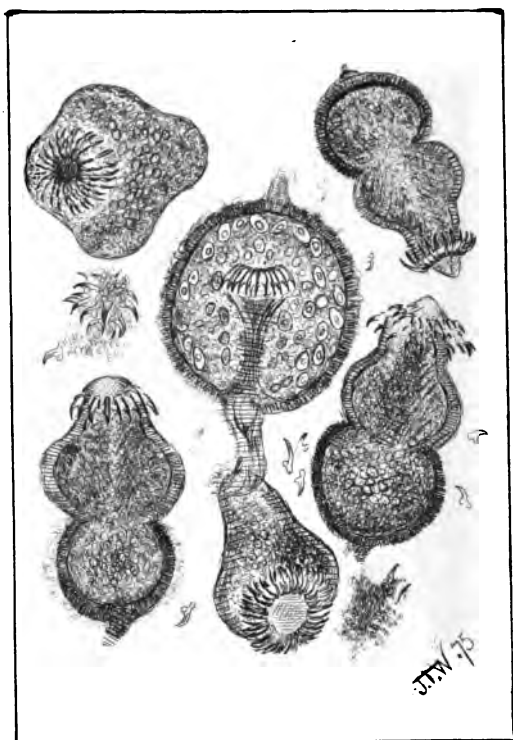
The ordinary extent of hepatic dulness in an adult of average size is 4 inches in the right mammary line, *i.e.* a line descending perpendicularly from the right nipple; $4\frac{1}{2}$ or 5 inches in the right axillary line, 4 inches in the right dorsal line, *i.e.* from lines drawn respectively from the centre of the axilla and from the lower angle of the scapula; 3 or 4 inches in the median line anteriorly, *i.e.* in the line of the ensiform cartilage.

Its position is somewhat arched. Commencing posteriorly about the tenth or twelfth dorsal vertebra, it ascends gradually towards the axilla and the nipple, and then again descends slightly towards the median line in front.

The liver may become enlarged from the normal dimensions given, and as this enlargement is a character common to many diseases of the organ, it has been happily suggested by Dr. Murchison to divide these, for the purposes of diagnosis, into Painless and Painful Enlargements. Painless enlargements are further characterised by an absence of jaundice and by a very chronic course; but in the painful enlargements jaundice is a very common symptom, and the progress is more rapid.

Among painless enlargements we have the so-called





TÆNIA ECHINOCOCCUS.
FROM HYDATID CYST OF LIVER.

amyloid liver, the fatty liver, hydatid tumour of the liver, and simple hypertrophy.

Among painful enlargements we have congestion, catarrh of the bile ducts, obstruction of the common duct and retention of bile, cancer, pyæmic and tropical abscesses.

PAINLESS ENLARGEMENTS OF LIVER.

Waxy, Lardaceous, or Amyloid Liver.—The liver may attain, under this disease, a great and uniform size, with a rounded, well-defined lower margin. The growth is slow and imperceptible, extending over many years, with constitutional symptoms of anæmia, and frequently with evidences of a similar disease in the kidneys, stomach, and spleen, the latter being often enlarged as well as the liver. The conditions favouring this degeneration are, as in the kidney, constitutional syphilis or other exhausting disease. From the nature of the disease it may be expected that it can hardly result in recovery, although its progress may be somewhat arrested.

Fatty Liver.—The enlargement is considerable, but not so great as in the previous form. On palpation, if the abdominal walls are thin, the organ seems soft and doughy, and can easily be pushed aside by the finger without causing any pain. Many and opposite conditions of the system may give rise to fatty liver. Among these may be specially mentioned alcoholism, phthisis, and general obesity, so that it may rather be considered as an adjunct to other constitutional states than a disease *per se*. Dr. Addison considered a greasy, velvety condition of the skin characteristic of fatty liver. On post-mortem examination the liver is found to be pale; and on cutting into it the knife is stained with grease. The disease is most marked at the periphery of the lobules where the cells are enlarged and contain fatty globules.

Hydatid Tumour depends on the development in the liver of the larvæ of the *tænia echinococcus*, which inhabits the intestines of the dog. The ova are supposed

to be voided with the *fæces* of the animal, and to enter the human system by means of food and drink, finding their way to the liver or other organs in an unexplained manner. Hydatid tumours of the liver, unlike those previously considered, do not consist in a general enlargement of the organ, but usually follow one direction in particular, either upwards, downwards, or laterally; hence the tumour formed may burst into the peritoneum, stomach, intestine, or lung. Sometimes it may suppurate, or it may dry up. The commencement is usually insidious, and the tumour, smooth and elastic, may attain a great size without the patient being aware of its existence, as the general health may be unaffected, there being neither dropsy nor jaundice.

Diagnosis.—When detected, the painlessness and the absence of the peculiar cachexia distinguish it from cancer; the history and the absence of constitutional symptoms from abscess; the position and non-jaundiced appearance of the patient from enlarged gall bladder. Occasionally, if near to the surface, there is a sign elicited by percussion, known as “hydatid vibration,” characterised by a peculiar trembling sensation being imparted to the three fingers of the left hand when they are laid flat on the tumour, and the back of the left middle finger is struck abruptly with the point of the middle finger of the right hand.

In *Simple Hypertrophy* the enlargement is not great, and is not attended with any prominent symptoms. It has been chiefly observed in some cases of diabetes and leucocythæmia.

Treatment.—The treatment of these painless affections of the liver is unsatisfactory. In waxy liver the diet ought to be nutritious, with a moderate allowance of stimulants. The tincture of iodine may be given, in doses of fifteen minims diluted, thrice daily. Complications, such as diarrhoea, vomiting, etc., must be treated as they arise. In fatty liver, if dependent on indolent habits, an anti-saccharine or a Banting dietary with exercise must be enforced, and if due to alcohol, withdraw the stimulants. In both cases, alkalies with taraxacum are

useful, or (F. 10); and, if circumstances permit, the waters of Carlsbad, Marienbad, or Homburg can be strongly recommended. Iodide of potassium and common salt were at one time considered serviceable in hydatids of the liver, but subsequent experience has not confirmed the hopes held forth, and it is now deemed advisable, if the tumour is increasing, to puncture and remove the liquid contents of the cyst by a fine trocar and canula. This being done, both the parent hydatids and the offspring die. Out of forty-six cases reported by Dr. Murchison, thirty-five appear to have been treated in this way with perfect success. It is necessary only to withdraw a portion of the fluid to cause the death of the hydatid.

PAINFUL ENLARGEMENTS OF LIVER.

HEPATIC CONGESTION.—The phrase "*congestion of the liver*" is too often used vaguely and applied to cases of indigestion, when there is probably little amiss with the organ. In true congestion there is uniform though not very great enlargement of the organ—probably to the extent of an inch—which disappears after a time, the surface projecting below the ribs being perfectly smooth, tender on pressure, and accompanied by an uneasy feeling rather than acute pain, radiating from the liver up to the right shoulder. This feeling is increased to actual pain sometimes after meals, or when the patient lies on the left side. After two or three days jaundice, rarely intense, is present, with nausea, loss of appetite, headache, scanty high-coloured urine, and other symptoms of indigestion. There may also be in acute cases evidences of obstructed circulation—splenic enlargement or ascites.

This congestion may be due to mechanical causes, *e.g.* consequent on disease of the mitral or tricuspid valve, or it may be dependent on errors of diet, excessive tippling, sedentary life, malarious or other poisons, or suppression of habitual discharges—the catamenia or bleeding from piles—or habitual constipation.

Treatment will vary with the cause, but in all cases of any severity hot poultices should be applied, with, in some instances, the application of leeches to the anus. The diet should be unirritating and non-alcoholic. Purgatives of sulphate of soda or magnesia, aided by blue pill or podophyllin, should be given at first, followed by the mineral acids with taraxacum and gentian. When wine requires to be taken, dry sherry and claret are to be preferred.

CATARRH OF THE BILE DUCTS is associated with the same clinical characters as those of congestion, yet with more marked tenderness over the gall bladder, which sometimes can be felt as a pyriform tumour; while "obstruction of the common duct" has the further addition of jaundice.

CANCER OF LIVER, in fully three-fourths of the cases, is secondary to cancer in other organs, as the stomach, uterus, or female breast. It runs a rapid course, being rarely prolonged beyond twelve months. It is attended with great pain and nodulated enlargement, generally with jaundice and ascites, and with other evidences of malignant disease.

Treatment can only be palliative.

PYÆMIC AND TROPICAL ABSCESSSES differ in this, that the former are many in number and small, while the latter is usually single and may attain a large size. The former are simply the evidence of the constitutional state termed pyæmia; while the latter, though rare in this country, may follow the acute hepatic inflammation of tropical climates. This inflammation has the symptoms detailed in congestion in an aggravated form, with the addition of high fever, and frequently of troublesome hiccup. Should the inflammation end in the formation of an abscess, this will be signalled by chills and hectic fever, and by fluctuation more or less distinct according to the distance of the abscess from the surface. The abscess, which is not generally very rapid in its progress, may

burst into the peritoneal cavity, giving rise to fatal peritonitis, or open into the biliary ducts and be discharged by the duodenum. More frequently, however, when the matter gets near the surface of the gland, adhesive inflammation is set up in the portion of the peritoneum immediately above it, and lymph is poured out which glues the organ to adjacent parts—to the abdominal parietes, the diaphragm, stomach, or some part of the intestine, and the pus is then discharged externally, or into the lung, pleura, or stomach (Tanner).

Tropical abscess is often associated with, and considered by some the result of, dysentery.

Treatment is similar to that mentioned under congestion, with the addition of the employment of chloride of ammonium and ipecacuanha in large doses. After suppuration has been established, the diet must be generous and wine or brandy allowed. Operative interference seems *advisable* when there is a visible fluctuating tumour; when a distinct tumour projects from the normal contour of the liver, even should there be no fluctuation, and when constitutional symptoms indicate its presence, though there should be no local signs. It is *inadvisable* when, from jaundice or other symptoms, there is reason to fear the existence of numerous abscesses. The operation should be performed with antiseptic precautions, or, if the abscess is large, by means of Bowditch's syringe or Dieulafoy's aspirator.

CONTRACTIONS OF THE LIVER.

The area of hepatic dulness may be diminished instead of increased, and, under the head of hepatic contraction, we have—1, simple atrophy; 2, acute yellow atrophy; 3, cirrhosis. In simple atrophy there is merely a diminution of the size and no alteration in the structure of the organ. The liver may be reduced to one-half its normal weight and bulk. The circumstances under which it occurs are two, viz. old age and inanition, the latter being dependent on either an insufficient supply of food from actual

want, or on a defective assimilation arising from other diseases, as cancer of the stomach.

In "acute yellow atrophy" not merely is the liver rapidly diminished in size, but the structure of the gland is altered. The secreting cells are broken up into granular matter and oil-globules, and the whole organ is found after death to be soft and yellow. The disease is rare and caused by unknown conditions, though it is most common in pregnant females. It results almost invariably in death by coma, preceded by gastric catarrh, bilious vomiting, jaundice, and cerebral symptoms of a typhoid character, with low muttering delirium and albuminous urine.

Treatment is unsatisfactory, though temporary improvement sometimes follows smart purgation by sulphate and carbonate of magnesia.

CIRRHOSIS, the so-called gin-drinker's or hobnailed liver, derives its name from κίρρῶς, yellow, the colour being due to the large amount of yellow pigment found in the secreting cells. The liver becomes reduced in size in consequence of destruction of its secreting tissue, this destruction again being due to hypertrophy of the connective tissue. The organ is thus dense and preternaturally hard, its outer surface being granular and nodulated, and on section it presents firm fibrous bands, between which are inclosed the remains of vessels and of bile ducts and islets of yellow secreting tissue.

The disease is chronic, usually extending over several years, and is insidious in commencement; at first there is probably increase in size, but latterly there is decided diminution in the bulk of the liver. In its early stages it is attended with symptoms of what may be termed alcoholic dyspepsia, sickness and retching in the morning, loathing for solid food, and a strong desire for stimulants, with some slight pain or tenderness over the hepatic region. In late stages, when the portal circulation has become obstructed, its hobnailed character may be felt externally—ascites appears and gradually increases, the spleen enlarges, and hæmorrhoids and hæmorrhages from the

stomach and bowels occasionally occur. The disease is marked by progressive emaciation and debility, by a persistent sallow complexion, though actual jaundice is rare, by increasing dyspeptic derangements, and it results fatally, sometimes by exhaustion attended with coma or œdema and inflammation of the lungs. It is chiefly met with in adults between 35 and 60, in males more than in females, and is almost invariably connected with a previous history of undiluted spirit-drinking on an empty stomach.

Treatment.—In the *early* stages the essential thing is to stop drinking habits. Spirits should be forbidden, although a little claret or hock may be allowed. The diet should consist of milk, eggs, plainly cooked white fish, game, and meat, while all hot spiced or greasy food must be avoided. Regular exercise should be enjoined, and the action of the bowels facilitated by occasional saline or mineral water aperient, and the use of nitro-muriatic acid. In the *second* stage, though curative treatment is impossible, yet the same dietary must be enjoined. Purgatives and diuretics should be given for the ascites; and, these failing, tapping must be had recourse to (F. 27, 35).

JAUNDICE.

The term jaundice is derived from the French *jaune*, yellow. Icterus, the Greek word for the golden thrush, another synonym, originated in the ancient idea that the sight of this bird by a jaundiced person was death to the bird but recovery to the patient. The affection has also been termed "*regius morbus*," from the royal and pleasant regimen prescribed for those who had it. Jaundice may be considered as a yellowness of the skin and conjunctivæ and of the tissues and secretions generally from impregnation with bile pigment. It is not, as this and preceding remarks indicate, a disease *per se*, but a symptom accompanying many complaints, and its existence has given rise to much controversy and many conflicting statements. All cases of jaundice may be referred to two great causes—1st, when it results from obstruction

to the common bile duct ; 2d, when it is independent of any obstruction. With regard to the first and most common origin there is not much dispute, as it is obviously then dependent on the bile which has been secreted being reabsorbed into the system. On the second point Frerichs's explanation, adopted by Dr. Murchison, seems to be the most feasible. It proceeds on the supposition that, even in health, in addition to the bile that passes away by the fæces, a greater or less amount is reabsorbed into the system and is at once transformed. Thus neither bile-acids nor bile-pigment can be discovered in the blood or in the urine, and consequently there is no jaundice. But in certain morbid states this transformation does not occur, and hence the bile circulates in the blood and stains the skin and other tissues, and jaundice is produced. These morbid states are the results of certain poisons, yellow fever, relapsing fever, snake bites, nervous influences, fear, rage, and deficient supply of oxygen, or there may be an excessive secretion of bile with great constipation. The obstructive causes, on the contrary, are from within, as gallstones,¹ or foreign bodies from the intestines ; or from without by pressure, as cancer of the liver or pancreas, loaded intestine, pregnant uterus, ovarian tumours, etc.

Symptoms.—The skin and conjunctivæ are of a yellow colour, the urine stains linen yellow, while on a few drops of nitric acid being added to it on a white plate, a play of colours, green, violet, pink, and yellow, is developed ; the fæces are whitish or of a light clay appearance. The skin is often itchy, the temper irritable, the taste bitter, with a sleepy, drowsy sensation at all times. The function of digestion is uninterfered with, except in regard to fatty articles.

Cerebral derangements may supervene if jaundice continues long, with stupor and delirium and a tendency to hæmorrhages.

¹ Gallstones consist of thickened bile, which in some instances has formed round a nucleus of solid biliary matter. They may exist in great numbers.

Gallstones.—Gallstones result from the precipitation of certain substances held in solution in the bile—the precipitate, whether amorphous or crystalline, uniting to form larger or smaller concretions. They are formed chiefly in the gall-bladder, and their number is variable, usually from five to ten. Sometimes the number given is greatly exceeded, reaching to a hundred or several hundred, of the size of a pea. Practically, biliary calculi may be divided into “small stones,” from the size of a pea to a grain of sand; “medium-sized,” from the size of a pea to a hazel-nut; “large stones,” usually single, from the size of a walnut and even up to the dimensions of a moderately filled gall-bladder. Their shape is variable, but in general they are round or egg-shaped, and sometimes facets are observed on them, whilst their corners are usually rounded off. Their flat surfaces appear ground, and are either plane or slightly concave or convex. They are in colour usually brown, greenish, or yellowish brown. They are somewhat greasy to the touch, and in consistence slight, so that they can easily be nicked with the finger nail. As their specific gravity is usually 1027 they cannot float in the bile, the specific gravity of which is from 1020 to 1026.

Structure and Composition.—In structure they are occasionally simple, consisting of pure crystallised cholesterine, bile resin, or cholesterine and soap; or they may be compound and nucleated, with a shell surrounding this nucleus, and a crust or rind.

The chemical composition of compound biliary gallstones consists of substances found in the bile, or of the decomposition of substances found there, viz. cholesterine from 70 to 80 per cent, biliary colouring matter, biliary acids and their salts, fatty acids, and lime, especially in the form of the carbonate.

How do they originate? In decomposition and stagnation of the bile, by which certain substances, notably cholesterine, may so increase that the bile can no longer hold them in solution; or from acidity instead of alkalinity of the bile permitting it to precipitate; or from the

natural solvents hastening the same result by being present in insufficient quantity. Numerous conditions favour their formation. They are rare below the age of twenty-five, tolerably frequent after forty, and relatively to these ages most numerous in old age; and with regard to the sexes, they are seen in females more frequently than males, the proportion being 2 : 3. Sedentary habits predispose to them, and it is asserted their occurrence is sometimes hereditary; a faulty luxurious diet begetting corpulency, and an extreme interval between meals allowing the bile to be retained too long in the gall-bladder, undoubtedly act as conduces to their formation. And to these must be added tumours pressing on the biliary passages, inflammation or degeneration of the gall-bladder, catarrh of the ducts, or any circumstance which tends to block up their channels and retard the flow of bile.

How are they evacuated? Naturally through the excretory duct of the liver or gall-bladder into the ductus communis choledochus, and thence into the intestinal canal, whence they usually escape per anum; occasionally they leave this natural path, and by ulceration and perforation reach various and often far distant parts of the body. Thus they may be found in the liver itself or hepatic duct; they may pass from the gall-bladder into the stomach or colon, or from the biliary passages into the duodenum. They may wander into the urinary passages, the interior of the portal vein, or the cavity of the abdomen. When they have reached the intestine they may become impacted, and give rise either to intestinal obstruction, or may cause perforation of the intestines.

So long as gallstones lie quietly in the gall-bladder they may give rise to no prominent symptoms, but the situation is altered when they are set in motion and advance through the excretory duct towards the intestine. Then their passage may give rise to what is termed "biliary" or "hepatic colic." With this colic there is pain setting in sharply and suddenly, beginning at the epigastrium and radiating upwards towards the right shoulder blade. The pain occurs in paroxysms, and is

described as being boring, burning, or tearing, and women say that it is greater even than labour pangs. There is also vomiting, at first of the food in the stomach, and, if there is complete obstruction of the duct, of colourless acid fluid, or of bilious matter if the obstruction is removed. After from twelve to twenty-four hours of pain and vomiting if the obstruction remains, jaundice more or less pronounced results. The urine becomes of a dark brown mahogany colour, and the fæces are pale. Permanent closure of the duct is rare, and the jaundice does not last long,—a couple of days, or at most a couple of weeks. Severe attacks have been known to terminate in collapse and death, but this is rare, and the recurrence of the colic seems to depend on varying causes, and to follow at no well-assured intervals.

Treatment.—The object of treatment in gallstones is obviously to moderate the pain and facilitate the passage of the stone. Hence, in severe cases, morphina must be injected subcutaneously every hour or two hours until the pain is relieved, while hot poultices are applied to the hepatic region; or, when these are not well borne, ice finely chopped and placed in a linen bag may be substituted. When the pain is less acute, a belladonna and chloroform liniment, without injections, may be trusted to. In an especially severe attack chloroform may be necessary, and may be preceded by the application of a few leeches to the hypochondrium. Immediate relief is sometimes afforded by permitting the patient to drink large quantities of hot water, to which sodii bicarbonas has been added—in the proportion of one drachm to the pint. To relieve the vomiting, ice may be sucked and small quantities of champagne taken. Recently podophylli tinct. has been recommended as a prophylactic in colic, and to prevent the re-formation of the stones. Many trust to calomel, scammony, and rhubarb, or sulphate of soda. If circumstances permit, the alkaline mineral waters of Carlsbad, Kissingen, and Vichy should be tried.

To dissolve stones already formed, sulphuric ether has long had a high reputation, and 20 to 30 drops may be

given two or three times daily, mixed with the yolk of egg, and with the addition of 5 or 6 minims of ol. terebinth. This should be continued until there is no pain in the side, neither after eating nor exercise, and no yellowness about the eyes. As acidity and superabundance of the bile are probably causes of the return of the concretions, enjoin abstinence from substances which render the urine yellow and notably acid, *e.g.* salads, spirits, excess of animal food, spices or asparagus, while a moderate use of fruits, fowls boiled or roasted, and farinaceous food may be recommended.

"In other cases of jaundice," says Dr. Tanner, "as we shall be merely working in the dark, it will be better to rest contented with resorting to gentle saline purgatives, diaphoretics, baths, rest, and regulated diet."

DISEASES OF THE PANCREAS.

Clinically we know little of the disease of the pancreas, as the organ is rarely affected primarily. As it lies deeply in the epigastric region, behind the stomach and in front of the aorta, it must be remembered that if a tumour exists in connection with it, it will be discovered in this region, and that pain will be referred either to the front or to the back at the junction of the lumbar and dorsal vertebræ. The principal diseases to which the pancreas appears liable are "morbid growths" (chiefly scirrhus); "calculi" (phosphate of lime) of varying size, obstructing the chief duct, and leading to enlargement of the organ and the formation of cysts; and "catarrhal inflammation" of the same duct.

The symptoms of any of these affections during life are obscure, and attended with debility and malnutrition. As one of the principal functions of the pancreas is to assist the digestion of fatty compounds in the food, the presence of fat in the stools has been detected in diseases of this organ.

Treatment.—All special treatment of affections so difficult to diagnose during life seems out of the question.

DISEASES OF THE LYMPHATIC SYSTEM.

DISEASES OF THE SPLEEN.

The spleen, situated in the left hypochondrium, weighs about six ounces ; its length is six inches, and its breadth rather more than three inches. Its external surface is convex ; its internal border, which is concave, is in relation with the cardiac end of the stomach, and has a vertical fissure—the hilus—at which apertures are found for the entrance and exit of vessels and nerves. It has no excretory duct, and its exact purpose in the system is as yet undetermined.

Composed essentially of an elastic fibrous framework (trabecular tissue), of Malpighian corpuscles, and of spleen-pulp, it may become distended with blood from slight causes, especially from those which interfere with the action of the skin, the liver, or the kidneys. These causes continuing, its elastic power may be lost and it thus becomes unable to send the accumulated blood onward. It may thus suffer from congestion leading to inflammation, abscess, and gangrene. Emboli are apt to lodge in the spleen in the course of typhus fever or pyæmia, giving rise to what are termed “hæmorrhagic infarctions.” These infarctions are observed at post-mortem examinations as wedge-shaped masses, with the base towards the surface of the organ. Sometimes their previous existence may be detected by a depressed cicatrix ; but, in pyæmia they break down into a purulent fluid and give rise to general inflammation of the organ. The spleen also may, though rarely, be the seat of disease of a lardaceous character, which is common, or cancerous, which is rare ; or serous and hydatid cysts may form within it. If portal obstruction exists, enlargement of the spleen is a necessary consequence. In addition to the forms of disease mentioned, Leucocythæmia and Hodgkin’s disease are by some considered

splenic diseases, and for convenience the latter will be included under this heading.

The most common form of splenic enlargement, leading to hypertrophy of its tissue, follows the fevers of tropical climates, and is known as "ague cake." The history of the case, the co-existence of intermittent fever or ague, or residence in the tropics even without having contracted fever, and the marked increase in the size of the organ, form clues to diagnosis. In addition, there are signs of anæmia, debility, a sallow unhealthy complexion, and various digestive derangements. Tenderness on pressure is evinced, but this does not occur to any great extent unless the peritoneal covering is involved. In protracted cases general dropsy sets in, and a murmur is heard following the first sound of the heart. Sometimes the spleen may be greatly enlarged without any marked disorder of the general health, with the exception of debility.

Treatment.—When the enlargement is the result of ague, change of climate and the administration of quinine are essential. In other cases steel and the bromide of potassium are serviceable. Arsenic is recommended in cases where there is no fever or periodicity. It can be conveniently given in the form of the iodidum arsenii in $\frac{1}{30}$ th gr. doses, accompanied or followed by iodide or bromide of potass, or both (F. 5).

DISEASES OF THE LYMPHATICS.

The vessels and glands of the lymphatic system are subject to diseases, and these have of late years attracted considerable attention. This attention is due to the important relations which exist between diseases of the lymphatics and zymotic or septic conditions, such as plague, diphtheria, typhus and typhoid fever, glanders, malignant pustule, and puerperal peritonitis. The lymphatics are also implicated in some skin diseases, notably in elephantiasis, and they convey to the system morbid products, such as tubercle and syphilis.

Acute inflammation of the lymphatics is met with in three forms.

1. Where the vessels are alone implicated (*Lymphangitis*).

2. When the glands are alone involved (*Adenitis*).

3. Where both structures are affected.

Lymphangitis may be due to different causes—(1) traumatic, from injury or wounds; (2) from irritation operating from without, as exposure to heat, undue pressure or friction, or (3) from irritation acting within, as from disease of joints and bones, or diphtheria; (4) from specific irritation, as from syphilis, gonorrhœa, plague or glanders.

Inflammation affecting the lymphatic vessels presents two forms, separate or combined. The condition is termed reticular lymphangitis when the capillary network is involved, and tubular lymphangitis when the main vessels are implicated. Inflammation of lymphatic glands has the external symptoms of all inflammations, and may end in resolution or suppuration or chronic induration, and may involve one gland or a cluster or chain of glands. Acute inflammation of lymphatic glands is seen in a characteristic form in bubo, where the preliminary features of inflammation end in suppuration.

There is in bubo little constitutional disturbance, but the indications are very different when inflammation is set up by septic matters. Then the typhoid condition is assumed, with rigors, great prostration, hectic fever, weak pulse, and rapid action of the heart.

Treatment.—The treatment of acute inflammation affecting the vessels and glands of the lymphatics varies according to the cause. It is essential in all cases, however, to get rid of the cause if possible, and to place the affected part in such a position as to avoid pressure or tension. If the condition be due to septic causes, the system must be supported from the first, as the state of matters is exceedingly grave. Sulph. quiniæ and stimulants are thus essential. If the inflammation is local, a saline purge with poultices and fomentations fulfils all the necessities of the case.

CHRONIC INFLAMMATION.—This form of inflammation can only affect the glands, and to it the term chronic adenitis may be applied. This condition may be the result of acute and sub-acute attacks of inflammation, or it may be set up simply from chronic irritation. The affected glands are large and firm, somewhat painful and tender, and the inflammation may end in degeneration of a caseous type or in suppuration.

Treatment.—Treatment is general and local,—supporting the system by internal remedies, notably cod-liver oil and syrup of the iodide of iron; and attempting to promote absorption by iodine ointment of varying strength.

Hypertrophy and atrophy of the lymphatic glands may ensue. Sometimes the hypertrophy is simply local; in other cases, as in Hodgkin's disease, progressive enlargement of the whole glandular system may result. In the latter case the glands show no tendency to destructive or ulcerative changes. There is simply an increase of the normal lymphatic structures.

Atrophy of lymphatic glands may occur after inflammation, as the result of old age, after the removal of a limb or its continued disease, or from other causes.

Morbid formations and deposits in glands may assume the type of cancer, albuminoid disease, pigmentation, syphilitic growths or tubercle.

Chronic changes may affect the lymphatic vessels—viz. dilatation and hypertrophy (*synonym*—*Lymphangiectasis* or obstruction).

Hypertrophy is most common in warm and moist climates, and may assume various forms. Sometimes this condition is congenital; in others it is evidently due to plugging of one or more of the lymphatic vessels, which leads to enlargement behind the seat of the impediment. A special growth has been termed lymphangiectasis, which has been divided into (1) simple, (2) cavernous, (3) cystoid.

The conditions occurring from hypertrophy are evidenced clinically by being visible when superficial, or when

occurring on a surface which can be inspected. When dilated absorbents are situated internally, they can only be recognised if the vessels rupture and permit an escape of their contents. Thus the contents may be observed in the stools or in the urine, and some pathologists believe that the condition of *Chyluria* is due to dilatation and rupture of lymphatic vessels in the urinary mucous membrane.

In obstruction there may be a condition of disease affecting the capillary plexus or the larger vessels. This may be occasioned by inflammation of the vessels, pressure by enlarged glands, aneurysms, or other tumours, or merely as a consequence of inflammation of the cellular tissue round the vessels. These conditions may lead to swelling and, as in hypertrophy, to rupture.

Treatment.—If due to tumours, the treatment lies within the sphere of surgery. If occasioned by other causes and superficial, proper bandaging may give the vessels support. Friction and kneading may relieve the cedema of obstruction.

HODGKIN'S DISEASE.

Synonym—Lymphadenoma.

The affection now to be considered has been termed "Hodgkin's disease," because that physician first drew attention to the morbid processes in question as a separate form of disease. In later times it has been called "malignant lymphoma," "lympho-sarcoma," "adenia," and "pseudo-leukæmia." The disease has been confounded with leucocythæmia, previously described, but it differs from it in these essential facts in the clinical history, that there is no increase in the white corpuscles of the blood, and that its course is comparatively rapid, lasting only from two to six months or a year.

The disease generally begins with a slight and painless swelling of the lymphatic glands of the neck, of one or both sides, and this swelling gradually increases until regular chains of swollen glands are formed from the

angle of the jaw to the clavicle. Later on, the inguinal and axillary glands are attacked, and finally the whole lymphatic apparatus, including the spleen. In a case which came under my observation in 1879, the disease was accompanied, and in fact ushered in, by profuse bleedings from the nose, which occurred again at intervals. There was latterly intense dyspnoea, probably through the enlargement of the bronchial glands compressing the bronchi. There was excessive palpitation of the heart on sitting up, also an anæmic murmur, and gradually increasing pallor. Diarrhoea came on towards the end, and the temperature, which had been below the normal standard, rose during the last few days to 102° Fahr. The man finally sank into a comatose state, and died six months after admission to the hospital. Briefly stated, the nature of "Hodgkin's disease" may be said to be this:—There is hyperplasia, increased cell-growth of the lymphatic glands. This increased cell-growth may be soft, and exude a milk-white juice on section, or it may be hard and dry, of a yellow colour, and almost fibrous in appearance. As the "soft" and "hard" forms are sometimes found on the same body, it has been inferred that the latter is only an advanced stage of the former.

Treatment.—A series of cases lately recorded by Billroth indicates that the administration of arsenic in gradually increasing doses was attended with beneficial results. Previous to this, the disease had been considered hopeless.

FILARIA SANGUINIS HOMINIS.

With chyluria the embryo *filaria sanguinis hominis* is usually found to be associated. Living specimens of the mature parasite, male and female, have, however, been observed in the tissues of those who appear never to have suffered from chyluria. They have been described as attenuated, fine, thread-like worms, of a white colour, the cuticle being smooth and devoid of transverse markings. In the female microscopic examination showed tubules

filled with ova in various stages of development, and also an intestinal tube. The ova do not possess any distinctly marked "shell." From the smallest to the largest nothing but a delicate pellicle can be distinguished as enveloping the embryo in all its stages.

With regard to the relations of the mature *filaria sanguinis hominis* to pathological phenomena, nothing as yet very decisive can be said. They seem not to be found in Europeans unless they have lived some considerable time in tropical climates. The specimens mentioned, as being seen and examined without any chyluria, were noticed in a young Indian. Dr. Bancroft of Brisbane has also discovered specimens of what may be believed to be the mature forms of the filaria, a dead specimen being observed in a lymphatic abscess, and four living specimens being obtained from a hydrocele of the spermatic cord. The persons in whom these specimens were found had not suffered from either chyluria or elephantiasis, nor were they known to harbour embryo filariæ in their blood.

Recently it has been shown that embryo filariæ in the blood are imbibed by the mosquito, undergo developmental changes, and are discharged into the water with the larvæ of the insect. Through this medium infection probably occurs. The habitat of the parent filaria is in the lymphatic trunk.

DISEASES OF THE THYROID BODY.

The thyroid body may be the seat of

Hypertrophy,

Atrophy,

Inflammation (*a*) acute, (*b*) chronic.

The most common disease of the thyroid body is

GOÎTRE.

Synonym—Bronchocele.

Goître consists essentially in hypertrophy of the normal

constituents of the thyroid gland, viz. the blood-vessels, the connective tissue, and the groups of inter-communicating vesicles. Sometimes these are all increased in proportion; the enlargement is, however, generally at the expense of the connective tissue and the vessels. The size varies from mere fulness to that of a coconut.

It is peculiar to certain localities, and constitutes the *goître* of the Swiss and the "Derbyshire neck" of England. It is also found in Nottinghamshire, Sussex, Yorkshire, and seems in all cases to depend on the water supply being greatly impregnated with the sulphate and carbonate of lime, and with the addition also, according to Virchow, of some endemic malarial influence not dependent on any of the causes mentioned. The enlargement is characterised by no pain. It is simply inconvenient by its bulk, which, however, may be attended with serious symptoms if there is pressure on the large veins, or on the sympathetic, pneumogastric, or recurrent laryngeal nerves, or if the œsophagus or trachea is compressed.

EXOPHTHALMIC GOÎTRE.

Synonyms—"Graves'" or "Basedow's Disease."

A peculiar enlargement of the thyroid body, occurring chiefly in young women, palpitation of the heart, uterine and menstrual derangements, and prominence of the eyeballs (*exophthalmos*) characterise this disease. It is rare in advanced life, and its origin sometimes dates from mental shock or from some acute affection. Some deem it due to cardiac palpitation, others attribute its primary cause to *goître*, but probably the best explanation is that it is connected with some affection of the sympathetic system, which allows passive dilatation of the vessels of the neck and thyroid body, implicates the blood supply of the orbit, and permits an excited action of the heart. In fatal cases morbid conditions of the cervical sympathetic have been recorded.

The symptoms may be either gradual or sudden in their

onset. In the latter case cardiac palpitation and distressing pulsation of the arteries of the neck quickly supervene, and then, after a variable period, changes in the eyes and thyroid body are observed. In the former case, the eyes may be first noticed as more prominent, glistening and staring, this prominence becoming more pronounced, generally in both, but sometimes only in one eye, until the lids cannot be closed over them. The protrusion also is variable, being most marked during the menstrual period and times of excitement. The sight, moreover, is not much affected, and there is little danger of inflammation in the eye or eyes though so little protected. Following on the prominence of the eye comes the gradual increase of the thyroid body, attended generally with a thrill and a more or less distinct arterial or venous murmur, and great nervous irritability.

Graves' disease is not usually fatal to life, for it may remain stationary, or actual recovery may ensue; or it may be slowly progressive, and the patient may be cut off by some affection of the lungs.

Treatment.—In the endemic form the patient should be removed to another situation, and iodine and its preparations should be used both externally and internally. In the exophthalmic form tincture of digitalis is useful for the excessive palpitation; or we may give belladonna combined with iron.

In obstinate cases operative measures, as passing a seton through the gland, or even its extirpation, have been recommended.

DISEASES OF THE SUPRA-RENAL CAPSULES.

The function of the supra-renal capsules is a subject of great interest and obscurity. Their purpose in the economy of nature is as yet undetermined. They seem, like the spleen, the thymus and the thyroid glands, to be

in the healthy state essential to the proper elaboration of the blood ; and to have as diseases

Hypertrophy,
Atrophy,
Lardaceous Disease.

A peculiar disease connected with the supra-renal capsule is termed

ADDISON'S DISEASE.

Synonym—Bronzed skin. *Melasma Addisonii*.

In investigating diseases of the spleen, the conviction seems to have grown on Dr. Addison that the supra-renal capsules were implicated, by observing that a peculiar form of anæmia with discoloration of the skin was not connected with disease of other organs usually associated with anæmia. The symptoms observed by him were great and increasing debility, a feeble pulse, faintness on the slightest exertion, loss of appetite, pain most marked in the epigastrium, but also shooting through between the scapulæ, and progressive emaciation. With these general symptoms the skin became gradually discoloured, this discoloration being most marked in the face, neck, superior extremities, penis, scrotum, and round the navel. The skin in the regions mentioned, and also on the hands, assumed a dingy, smoky hue, which in advanced cases deepened into a "bronzed" colour. So marked was this in one case recorded by Dr. Addison, "that, but for the features, the patient might have been mistaken for a mulatto."

Cases of Addison's disease progress to an unfavourable termination in the course of one or two years on an average. The disease is most frequently observed in the active period of adult life and in those employed in manual labour. Dr. Wilks says the morbid changes in the capsules are, "first, the deposition of a translucent softish homogeneous substance ; subsequently the degeneration of this into a yellowish-white opaque matter ; and afterwards a softening into a so-called abscess, or drying

up into a chalky mass." In other cases the solar plexus of nerves is found matted together and thickened. The "bronzing" of the skin increases with the general debility.

Treatment.—No treatment seems of any avail. Cod-liver oil may, however, be tried as recommended by Dr. M'Call Anderson.

DISEASES OF THE KIDNEYS.

Healthy urine recently passed has a pale yellow colour, and a faint and peculiar odour due to the presence of certain volatile organic acids.

In reaction it is acid, this acidity being determined by placing in it blue litmus paper, which on being withdrawn shows a red colour.

Healthy acid urine being kept undergoes a series of changes, which should be clearly understood. First there occurs a precipitation of the amorphous urates, then of uric acid; and sometimes oxalate of lime. After a day or two acid fermentation takes place, and this is probably due to a vegetable like the *torula cerevisiæ* or yeast plant. In the course of four days the acidity becomes faint, and the urine loses its pleasant odour and enters into a state of ammoniacal putrefaction. Its clearness departs and turbidity ensues owing to the development of many bacteria. The amorphous-urates deposit is replaced by dark round masses of urate of ammonia, uric-acid crystals give way to bright prisms of triple phosphate, and an abundant sediment of amorphous phosphate of lime sinks to the bottom of the vessel. When the urine becomes fairly putrid the vegetations mentioned cease to grow.

Urines of low density and faint acidity do not deposit amorphous urates on standing, but pass rapidly into a state of ammoniacal decomposition. This alkaline change is the result of bacterial fermentation. The urea is transformed into carbonate of ammonia. Such urine, from its alkaline character, renders red litmus paper blue, has the

pungent smell of ammonia, and gives a white vapour of chloride of ammonium on holding over it a glass rod dipped in hydrochloric acid. Such urine is unfit for clinical examination, and should be rejected unless the changes mentioned have occurred in the bladder, and a more natural specimen cannot be obtained.



Fig. 14.

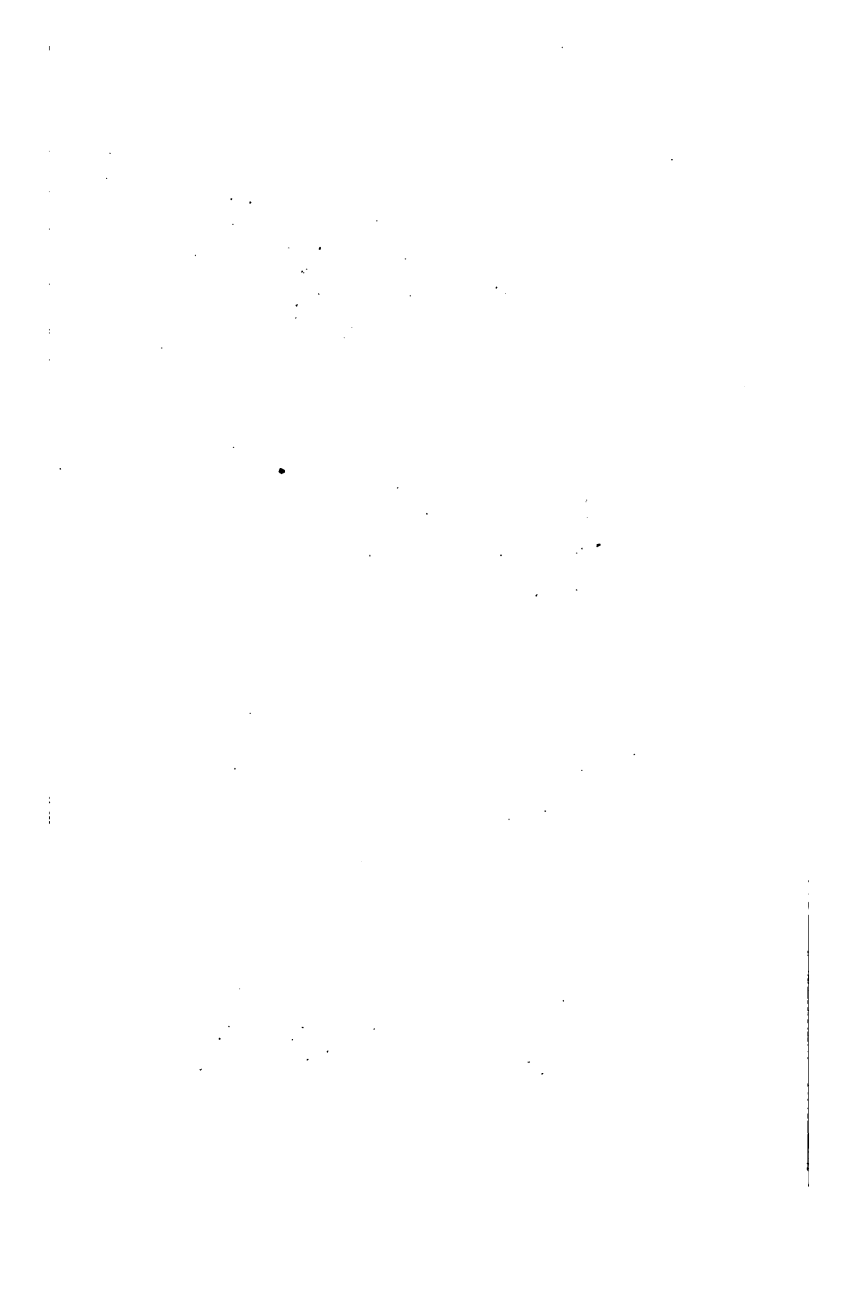
It is necessary to examine urine within a few hours of its being passed, when it is cold and no appreciable alteration taken place in its colour or in its reaction.

The quantity of urine passed in twenty-four hours in health as a rule is forty-five to fifty ounces. Its specific gravity should be from 1015 to 1025, and is determined by an instrument termed the URINOMETER. What is meant by specific gravity is at once seen by placing the urinometer in distilled water and afterwards in healthy urine. In the former case the instrument will float at zero, in the latter at the figures mentioned previously. The urinometer placed in healthy urine is seen delineated in Fig. 14. The determination of the specific gravity is an essential and important step for diagnosing the nature of disease—for if below 1015 there is probably albumen, if above 1025 there is possibly sugar.

If the urine exhibits albumen by the tests to be afterwards mentioned, it should be set aside to observe if the deposits show tube-casts under the microscope. If sugar is detected, an examination as to its quantity may be entered upon at once, as saccharine urine rarely reveals by standing any tube-cast or crystalline deposit.

The INORGANIC DEPOSITS of healthy urine appear within twelve hours of its being voided, as epithelial scales, amorphous urates, and triple phosphates.

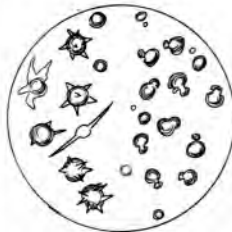
Urine containing a superabundance of urates has a very acid reaction, and a pinkish-red deposit, which heat will at once dissolve, leaving the urine clear. Urine containing phosphates has an alkaline reaction at the expiry of



CRYSTALLINE AND AMORPHOUS URINARY DEPOSITS.



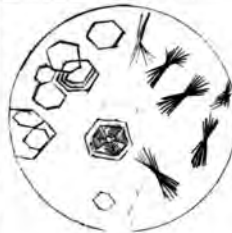
CHOLESTERINE
AMORPHOUS URATES



URATES OF SODA
URATES OF AMMONIA



OXALATES OF LIME



CYSTINE
TYROSINE



URIC ACID



URIC ACID



TRIPLE PHOSPHATES



TRIPLE PHOSPHATES

the time previously mentioned, and a white deposit, which heat alone does not dissolve, but on the contrary renders the specimen examined cloudy, this cloudiness disappearing on the addition of a drop or two of nitric acid.

The other crystalline deposits in urine are uric acid and oxalate of lime. The former present various shapes under the microscope, but they may be remembered and recognised by the fact that they are always coloured either RED or ORANGE-YELLOW.

Oxalate of lime is seen in an octahedral form of various sizes, being rarely observed as having a dumb-bell appearance.

Heat has no effect on these two deposits, but liquor potassæ dissolves uric acid crystals, though not the oxalates, which require a MINERAL ACID.

These deposits, which are correctly delineated on the plates, indicate no structural disease of the kidney. Their nature, however, requires some consideration, which will now be given under separate headings, and also the constitution and formation of urea, which is the most important constituent of the urine.

In 1000 parts urine we have—

	Water	-	-	-	-	954.81
	Solid matters	-	-	-	-	45.19
						<hr/>
	Urea	-	-	-	-	21.57
	Uric acid	-	-	-	-	0.36
Extractives.	Creatine, creatinine, ammonia, hippuric acid, xanthine, hypoxanthine, sarcine, pigment, unoxidised sulphur and phosphorus, mucus, etc.					6.53
	Chlorine	-	-	-	-	4.57
Fixed Salts.	Sulphuric acid	-	-	-	-	1.31
	Phosphoric acid	-	-	-	-	2.09
	Potash	-	-	-	-	1.40
	Soda	-	-	-	-	7.19
	Lime	-	-	-	-	0.11
	Magnesia	-	-	-	-	0.12

A ready means of detecting urea is by the addition of nitric acid to urine containing it in excess, when crystals of nitrate of urea form. Thus if equal parts of such urine and nitric acid are placed in a test-tube, and this is put

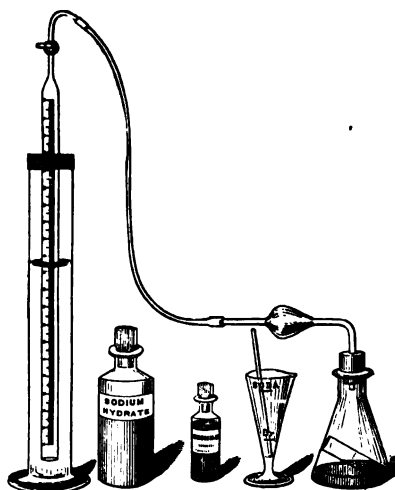


Fig. 15.

into cold water, the nitrate of urea crystals will quickly settle. With normal urine this does not occur.

Another method of detecting excess of urea is to dip a thread into a drop of urine placed on a glass slide. This drop and one half of the thread are then protected by a cover-glass and placed under the microscope; and the other end of the thread is moistened with nitric acid. Crystals of nitrate of urea in hexagonal plates are detected forming, if urea is in excess in the specimen examined.

All urine contains urea, and in varying proportions, if disease exists. It may be considered as the result of the metamorphosis of the nitrogenous elements of the food and tissues. In health the average amount passed by a

male adult in a number of cases examined by me was about 8 grains to the ounce, or in all about 400 to 450 grains daily. The quantity was determined by "the ureameter" (Fig. 15) in the manner described in the appendix, p. 533.

The "ureameter" will assume importance in the treatment of disease. It is easily worked. It gives perfectly accurate results. Careful daily testing may be done by an experienced nurse; and in chronic Bright's disease, where a marked deficiency from the ordinary quantity usually passed is detected, it may lead to measures calculated to dispel uræmia. Active cathartics given early may avert the threatened attack.

In acute rheumatism the quantity passed per ounce is greatly increased—in fact nearly doubled, 16 grains not being an uncommon amount. Should the average high percentage be diminished without the fever being lowered, it is probable there may be an attack of rheumatic cerebritis, which should be anticipated by appropriate remedies.

In continued fever and in late stages of phthisis interesting results are obtained, bearing in the former case on the looked-for crisis and return to health; in the latter, plainly indicating when a fatal result may be expected.

Dr. Mortimer Granville has lately drawn attention to the use of the ureameter in his valuable treatise on gout, and to a great extent the treatment suggested is based on the results obtained. This is alluded to under the clinical importance of uric acid and urates.

Clinical importance of Uric Acid Crystals and Urates.—These deposits occur in excess after errors in eating or drinking, and are observed as a red deposit in the vessel when the urine cools. They are of little importance and should give rise to no alarm, unless they persist for a length of time, as in cirrhosis of the liver and deep-seated organic diseases. In the slighter forms, excess of urates is remedied by an antibilious pill followed by Lithia, Vichy, or Contrexéville water, and regulation of the diet. In gout, recent observations seem to indicate a perversion of function in relation to the pre-

sence of uric acid in the blood ; and if this acid is not discharged by the liver or kidneys, urates—especially in the form of sodium urate—will be thrown out into the inter-spaces of the tissues, and an attack of the malady with localised symptoms will occur. It is, therefore, essential—if this theory is accepted—to aid the elimination of the urates by appropriate remedies, as \mathcal{R} vini colchici $\mathfrak{z}\text{iv}$, potassii chloratis $\mathfrak{z}\text{iii}$, tincturæ serpentariæ $\mathfrak{z}\text{iss}$, decocti scoparii, decocti senegæ $\mathfrak{a}\mathfrak{a}$ $\mathfrak{z}\text{xii}$.— \mathcal{M} . Sig. $\mathfrak{z}\text{i}$ every 4 hours.

Oxalate of Lime.—The occasional occurrence of oxalates in urine—neutral or slightly alkaline—signifies little, as they depend generally on errors of diet, and yield to treatment by nitro-hydrochloric acid. If patients in an hospital ward take cabbage to dinner, there is generally afterwards in the course of the day a quantity of oxalates detected in the urine, assuming the characteristic appearance seen in the accompanying plate.

Phosphates.—Two kinds of phosphates are found in urine when it has become alkaline : (1st) amorphous phosphate of lime, (2d) ammoniaco-magnesian or triple phosphate. These are always deposited when, through fermentation, the urine becomes alkaline. The phosphate of lime is observed as an amorphous deposit under the microscope, and the triple phosphate occurs in rhombic prisms. A third variety of phosphates is observed in the stellar phosphate of lime. They are rarely seen, and may for all practical purposes be considered simply as clinical curiosities, if only a few are observed ; but if in quantity and continued for some days, Dr. Roberts deems them of grave import.

Occasionally from diminished acidity of the urine, due to want of exercise or excess of mental effort, the urine is feebly acid or nearly alkaline when voided ; and such urine may be turbid from phosphates even when passed. This need give rise to no anxiety. Exercise and a mineral acid with a vegetable tonic, and cessation from work, will soon restore the normal acidity to the urine, and dispel the phosphates.

The quantity of phosphates is, however, increased in febrile disorders and in diseases of the nerves and bones; while it is decreased in Bright's disease and in fevers after the disappearance of the febrile symptoms.

The deceptive cloud occasioned by boiling urine containing triple phosphates is removed (as stated at page 313) by adding to the boiling solution a drop or two of nitric acid, which at once clears up the urine. Boiling without the acid will not, however, do so.

Chlorides.—Chlorine is present in the urine in combination with ammonia, fixed alkalies, or alkaline earths. The quantity chiefly depends on the amount of salt taken with the food. Chlorides are easily detected by adding a solution of nitrate of silver to urine in a test-tube, when a curdy precipitate is formed. Their absence from the urine is of clinical significance, as in the acute stage of pneumonia.

Sulphates.—Sulphur appears in the urine, as

1. Sulphuric acid free, or in conjunction with organic radicals;
2. Oxidisable sulphur compounds, as taurine;
3. Sulphur compounds oxidisable with difficulty.

For details as to the mode of detecting them the student is referred to text books of chemistry.

Clinically the estimation of the sulphates is of importance in diagnosing the condition of the liver. The more sulphur is excreted by the bile, the less appears in the urine, and *vice versa*.

Pigment.—The normal pigment in urine is urobilin. Indican is also found in small quantities, and is detected by mixing the urine with its own bulk of hydrochloric acid, and adding a drop or two of a saturated solution of chloride of lime. The indican is thus split up, yielding indigo, which colours the urine blue, and may be removed by shaking with chloroform and allowing it to settle.

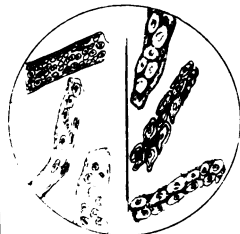
Indican appears to be formed from indol in pancreatic digestion, and is increased in partial or complete obstruction of the small intestine; also in phthisis, cancer of the stomach, Addison's disease, and cholera.

Mucus.—Mucus in varying quantities is generally found in all urines. It is notably observed in cystitis or inflammation of the bladder. The urine is then ammoniacal, turbid, and ropy, giving the same reaction as purulent urine with liquor potassæ.

If tube-casts are observed under the microscope, they indicate structural disease of the kidney. They are abnormal substances, and are termed "organic deposits." Of these "deposits" there are seven kinds :

1. Epithelial casts.
 2. Opaque granular casts.
 3. Transparent or waxy casts.
 4. Fatty casts.
 5. Blood casts.
 6. Pus corpuscles.
 7. Blood corpuscles.
1. Epithelial casts or desquamative casts consist of a cylinder of coagulable matter on which are observed epithelial cells.
 2. Opaque granular casts are small, and usually consist of a cylinder, studded over with small masses of fat, epithelium, oxalates, etc., which give them a granular appearance, characteristic of a chronic and intractable form of Bright's disease.
 3. Transparent or waxy casts are clear glassy cylinders, presenting the appearance of a structureless substance. They are most often seen in amyloid or waxy disease of the kidneys.
 4. Fatty casts have a similar origin to granular casts, only differing in this, that the cells have undergone the "fatty change," and the casts appear covered with oil globules. They are also characteristic of a chronic form of Bright's disease.
 5. Blood casts or exudation casts. These consist of the coagulated fibrinous exudation, and present a mould of the uriniferous tubules, which is poured into the tubules as the result of recent inflammation. Hence these casts are *only* observed in acute inflammatory disease of the kidneys.

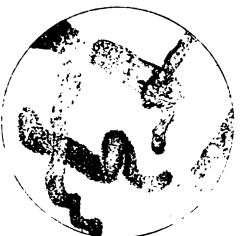
RENAL TUBE CASTS. - PUS AND BLOOD CORPUSCLES. -



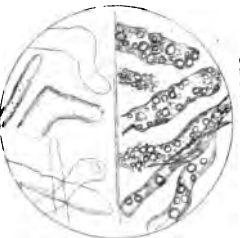
BLOOD CASTS
EPITHELIAL CASTS



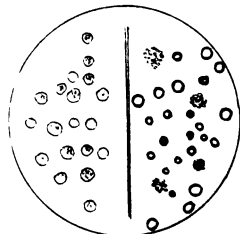
HYALINE CASTS



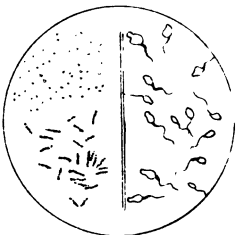
GRANULAR CASTS



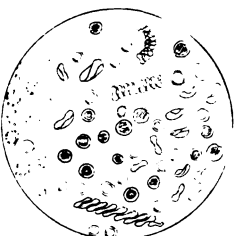
WAXY CASTS
FATTY CASTS



MUCOUS GLOBULES
FAT GLOBULES



VIBRIOS BACTERIA
SPERMATOCOA



BLOOD CORPUSCLES



EPITHELIAL SCALES
PUS CORPUSCLES

JTW

6. A pus corpuscle is a spherical cell ; and examined under the microscope without reagents, appears about one-third larger than a red blood disc, opaque, granular on the surface, and yellowish. Treated with water alone a nucleus may appear ; but this is rendered more distinct if a drop of acetic acid be put upon the slide and allowed to run beneath the cover-glass. The nucleus then comes out cleft into two, three, or four nucleoli ; and, if an excess of acid is added, the cell-wall disappears, and the nuclei float free in the fluid.
7. Blood corpuscles in urine present under the microscope no rouleaux, but stand out distinct in DILUTE urine as pale circles with sharp delicate outlines, and without any appearance of cell-contents. In more CONCENTRATED urine they preserve nearly their normal biconcave contour, and appear smaller and more deeply shaded ; occasionally they are seen shrunken and crumpled. They are distinguished from other cell-contents found in urine by THE ABSENCE OF A NUCLEUS ; and if the biconcave form is preserved, the diagnosis is of course certain.

Unhealthy urine containing pus or blood has, in addition to microscopic tests, a distinct characteristic appearance, which is recognised by chemical reagents. Urine containing pus is milky when passed, and the pus settles down in the vessel in a dense yellowish-white sediment. On the addition of liquor potassæ purulent urine becomes thick, sticky, and ropy, as is evident on attempting to pour it into another vessel.

Urine having blood in any but the smallest quantity has a smoky or red appearance, and coagulates when heated.

Urine containing bile has distinct tests. If bile exists in the urine it can be detected by placing a few drops of strong nitric acid and urine on different parts of a white plate, and then allowing the two fluids to meet. At their

junction, if bile is present, there will be observed a play of colours—*brown, green, blue, violet, red, and yellow*. Bile-acids are detected by placing $\frac{z}{ii}$ of urine in a test tube with a little syrup, and adding strong sulphuric acid. If bile-acids are present a DEEP PURPLE HUE is observed where the liquids come in contact.

Certain medicinal and poisonous substances administered internally produce peculiar alterations of colour in the urine. Creasote given internally and its application externally have produced DARK, almost BLACK urine. Carbolic acid in solution applied to wounds sometimes causes the urine to become black, and the colour, though not present at first, is made apparent when the urine is exposed to air. Gallic acid also when taken internally communicates a dusky hue to the urine.

Rhubarb given internally colours the urine a deep gamboge yellow, and this by the addition of ammonia is changed to red. Senna causes a brownish, and logwood a reddish tinge when administered as infusions. Santonin gives an orange-red colour to the urine if it be alkaline, and a golden-yellow if it be acid.

ALBUMEN.—The most important abnormal constituent in the urine is albumen, and it is essential that the tests for its presence there should be familiarly and practically known.

Since the last edition of this book was issued, new tests for urine have been brought before the profession with the view of superseding those which time and experience had pronounced to be invaluable. These tests, so far as albumen is concerned, are picric acid, potassio-mercuric iodide, ferrocyanide of potassium, and tungstate of soda. A few facts derived from experiments will now be mentioned about these tests and their comparative value considered.

1st, Picric acid. This acid is obtained from the action of nitric acid on salicin and its compounds. It is seen in two forms, crystalline and powdered, and it is in the latter that it should be used as a test. The powder is yellow in colour, *bitter* and acrid in taste, and insoluble in

cold water. An ounce of distilled water, after it has been heated to the boiling point, dissolves 5·6 grains of the acid, and, if the solution is allowed to cool, it will be observed to be a yellow, clear fluid, having at the bottom of the test tube a slight crystalline deposit. Upon being re-boiled for about 60 seconds, this deposit disappears and does not return when the solution is cooled.

In the proportion, therefore, of 5·6 grains of picric acid to ʒi of boiled distilled water, we have "the test solution of picric acid." The method of employing it is simple. Add it to healthy urine in the proportion of 40 minims of the solution to one drachm of urine. No TURBIDITY is occasioned by the cold mixture, or when they are heated together to the boiling point. If, however, a citric acid paper is added previous to boiling the mixture of healthy urine and picric acid solution, it may be found on cooling that a slight haziness is perceived. If so it indicates that MUCIN is contained in the urine, which like albumen is unchanged by heat. ALONE THE PICRIC ACID SOLUTION DOES NOT PRECIPITATE MUCIN, BUT ONLY WHEN THE CITRIC ACID PAPER OR DILUTE ACETIC ACID IS ADDED.

If albuminous urine is tested by picric acid solution, it is advisable to place one drachm in a test tube, slant this, and slowly pour down the solution. It will be found, if albumen is present in any quantity, that at the point of contact of the fluids turbidity ensues, and, if the test tube is put aside for a minute or two, the result will be—a clear solution at the top, a ring of coagulated albumen at the centre, while at the bottom the fluid is clear.

If heat is now applied to the mixture until boiling ensues, it will be observed that the albuminous ring disappears, and there remains a turbid yellow solution, in which by transmitted light albuminous shreds are visible. On this being allowed to cool and settle, there will be seen at the bottom of the tube an albuminous precipitate varying according to the quantity of albumen the urine contains, and above this will be detected a turbid yellow cloud.

Picric acid may be used dry, and for convenience may be carried in the pocket in the form of a powder. Then when urine is tested at the patient's bedside, a small quantity of the powder, generally $\frac{1}{3}$ of a grain, or as much say as will lie on the point of a penknife, is placed in a test tube, and water poured on it to the extent of half a drachm. When this is heated and boiled, the picric acid will be dissolved, and then an equal proportion of the suspected urine, half a drachm, is poured into the test tube. Heat again being applied will show by the usual turbidity if albumen is present.

The other new tests for albumen may now be alluded to.

1. *Potassio-Mercuric Iodide*.—This, like the other two tests to be mentioned, is contained in a small paper packet which in the interior has citric acid papers in one division, and the potassio-mercuric iodide papers in another. To the suspected urine one of both papers is added, and the urine is boiled; should no albumen be present the urine remains clear. If albumen is present a white solution is formed in which the albuminous shreds float; on cooling these settle to the bottom, leaving a white cloud above. Should the urine be **HEALTHY**, but contain **MUCIN**, it will be observed on boiling that a slight opalescence forms which heat does not dissolve, and which comes out more when the urine is cooled. It is not like the albuminous cloudiness. It is scantier and thinner, but it might deceive and lead to grave errors. Allowed to settle for twenty-four hours, **HEALTHY URINE** to which the potassio-mercuric iodide tablets are added has, I find, its upper strata perfectly clear, but at the bottom of the tube about $\frac{1}{12}$ of an inch is sediment of a reddish-white consistence. There is very little difference in this sediment of healthy urine from that which appears by the same test in albuminous urine, except that the colour is a little paler.

2. *Ferrocyanide of Potassium*.—One tablet of this and one of citric acid are placed in a small quantity of albuminous urine. On boiling there is an abundant white opalescence. When allowed to cool and settle it is found that $\frac{2}{3}$ of the urine in the test tube becomes

clear, and the remaining $\frac{1}{3}$ consists of a whitish-green sediment.

To healthy urine the same tests were applied, with the result that there was after boiling little if any difference in the urine. When it had cooled and settled, there appeared in 12 hours a white deposit occupying about $\frac{1}{12}$ of the tube. This deposit seemed to be urates, for it disappeared on heat being applied. When the urine contained mucin, the deceptive cloudiness mentioned under the previous test was obtained from the ferrocyanide and citric acid tablets.

3. *Tungstate of Soda*.—Tested by tungstate of soda and citric acid tablets, albuminous urine gave a decided whiteness which settled down, and when the urine had cooled occupied $\frac{1}{3}$ of the bottom of the test tube.

With healthy urine the addition of one tablet of citric acid, and one of tungstate of soda, gave, on boiling, no discoloration. On its being examined after settling for 12 hours there was a deposit similar to, and of the same extent as, the one described under ferrocyanide of potassium. The application of heat led to its being dissolved as in the previous instance.

When the urine contained mucin the tungstate of soda test behaved in a similar manner to the potassio-mercuric iodide and ferrocyanide of potassium tests.

These observations on the new tests for albumen were conducted last winter for fully six weeks. I obtained specimens of healthy and albuminous urine from the Royal Infirmaries of Edinburgh and Glasgow, and I had no preconceived ideas as to the action of the tests. Repeated experiments, however, forced me to consider them untrustworthy in comparison with the older tests, which are "heat" and "nitric acid." To apply these a test tube should be filled to the depth of about an inch with the suspected urine and heat applied by means of a spirit lamp to its *upper stratum* until it boils, when, if albumen be present, it becomes turbid and cloudy in various degrees. This cloudiness PERSISTS after the addition of nitric acid. IT IS IMPORTANT TO REMEMBER THAT IF

THE URINE IS ALKALINE HEAT WILL NOT AFFECT THE ALBUMEN AND MAKE IT COAGULATE UNTIL A FEW DROPS OF ACETIC ACID HAVE BEEN ADDED.

Nitric acid alone is an excellent test for albumen. A test tube being filled as before with urine and inclined a little, nitric acid is poured in so as to trickle slowly down the side to the bottom. If albumen be present three strata will be observed :—

1. One perfectly colourless of nitric acid at the bottom.
2. Above this the coagulated albumen.
3. At the top the unaltered urine.

With healthy urine there is no reaction.

In considering the tests mentioned, I have to affirm my decided belief that for all practical purposes the “heat” and “nitric acid” tests are the best for detecting albumen in the urine.

These tests are easily remembered. They are familiar to every one who has had hospital experience. They are not, like the other new tests, so fine as to lead to error between mucin and albumen, and to create alarm when none should be present. If they are employed with the precautions mentioned in the text, I have no hesitation in stating that they will discover any appreciable quantity of albumen, and form the basis for a safe and ready diagnosis of diseased conditions. I apprehend that what may be termed physiological albumen, occurring occasionally in health from errors of diet and detected by picric acid but not by nitric acid or heat, is a phenomenon which need give rise to no alarm on the physician's or patient's part, unless it is accompanied by evidences of kidney disease, such as the trained observer will easily obtain by detecting with the microscope whether there is present in the urine some one of the forms of tube-casts, already described and delineated. At the same time the delicacy of the picric acid test should make it most advantageous during recovery from scarlet fever, at which time the earliest symptoms of albumen should be carefully watched for by the urine being daily tested, in order, if possible, to obviate by hygienic and medicinal

means the renal sequelæ. The picric acid test should not, however, be relied on alone, but should be confirmed or discredited by the test of nitric acid and heat, in the manner indicated in the text.

I think it is well here to refer to errors which may occur from testing albuminous urine—1st by heat, 2d by nitric acid.

1. If heat alone is relied on it might mislead in two opposite directions. First, by not detecting albumen in alkaline urine; hence the necessity of primarily using test paper, and, if the urine is alkaline, adding a drop or two of acetic acid. Second, by giving a delusive phosphatic precipitate in non-albuminous urine—a drop of nitric acid will at once settle this by clearing away the precipitate or cloudiness.

2. Urine loaded with urates presents to the eye a turbid appearance. A drop or two of nitric acid may in such cases not clear up or dissolve the urates, and albumen may be falsely diagnosed. This error is guarded against by first applying heat. The urates then disappear and an albuminous precipitate is formed which the subsequent addition of nitric acid fails to dissolve.

3. It sometimes happens that when nitric acid is added to clear, yet highly acid urine, recently passed, it causes a turbidity from the deposition of urates. This turbidity is, however, dissolved by heat, while heat has no effect on the albuminous precipitate.

4. A single drop of nitric acid will in highly albuminous urine form a white film or coagulum. This is re-dissolved by shaking the tube, and the subsequent application of heat to this specimen will not produce a precipitate of albumen. The explanation of this is, that nitrate of albumen has been formed, which is not coagulable by heat; but it is to be noted that a further drop or two of nitric acid will dissolve the nitrate and cause a permanent precipitate.

A student therefore in a clinical ward and undergoing a clinical examination should remember the facts mentioned, and proceed to the examination of any specimen

of urine placed before him in the following systematic manner, placing the results in a tabular form on paper :—

1. Note the colour of the urine.
2. Test its reaction by litmus paper.
3. Indicate its specific gravity by reading off the number obtained by placing the urinometer in the specimen with the bulb downwards.¹
4. If the specific gravity be lower than normal, test for albumen both by heat and nitric acid, remembering the precautions indicated ; if higher, test for sugar with Fehling's solution, or picric acid solution, or caustic potash.
5. Place any deposit in the urine glass under the microscope and describe whether it is crystalline, amorphous, tube-casts, blood, or pus. In pus corroborate the diagnosis by adding liquor potassæ to a specimen of the urine, and observe its thick ropy condition on attempting to pour it out into another glass.
6. Then indicate the nature of the disease.

Albumen having been detected in the urine leads to the inquiry, What significance has it and with what diseases is it associated ? The answer to this is, "hyperæmia or congestion of the kidney, acute nephritis, and also chronic Bright's disease of the kidneys ;" although it may be found accompanying

"Pregnancy, or the puerperal state, febrile and inflammatory diseases, impediments to the circulation of the blood, a watery and weakened state of the blood—as in scurvy, purpura, lead-poisoning,—nervous disturbances (neurotic albuminuria), functional disorders of adolescence (physiological albuminuria)."

¹ I remember an amusing instance of the neglect of this direction when I asked a student to take the specific gravity with the urinometer. He had evidently never seen or heard of the instrument before, and after looking curiously at it as a hospital phenomenon, he placed it with index downwards in the urine and then doubtfully told me, as he held it up to the light, "It was high, sir, very high !"

The quantitative estimation of albumen in the urine is not yet placed on a very distinct and easily applied basis. It may, however, be determined by bringing a measured quantity of albuminous urine to a slightly acid condition; boil; throw the precipitate on a weighed filter; wash;

URINARY TEST-CASE.¹



Fig. 16.

dry at 212° ; and weigh. Or, for practical clinical purposes, boil a certain quantity of the urine in a test tube with a drop or two of ACETIC ACID. The albumen coagulates, forms flakes, and sinks to the bottom of the tube. The proportion of the albuminous deposit to the amount

¹ This urinary test-case has been prepared at my suggestion by Mr. Hume, of Edinburgh. It contains (a) nitric acid; (b) Fehling's solution; (c) test-tubes; (d) test-papers; (e) small spirit-lamp—in fact, everything required for testing; and the price is very moderate.

of urine left uncoagulated in the tube is represented in numbers as $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{12}$, and so on.

If the amount of albumen is too small to cause any appreciable deposit, this condition is noted by simply stating that the urine examined was "cloudy" or "opalescent."

Physiological Albuminuria.—Physiological albuminuria in healthy persons, without structural disease of the kidneys, is now an admitted condition of the system.

Thus albumen is sometimes observed after great bodily fatigue or extreme intellectual labour. Excess of sexual excitement or menstruation may also evoke it.

When albumen is detected, rest in bed and a light diet without animal food will generally be sufficient to diminish if not actually to check the amount excreted. The patient's alarm should be subdued by a frank explanation of the nature of the case. Particularly he should be told he has no structural disease of the kidney, and that no tube-casts have been observed under the microscope. The mental quiet thus induced aids materially the bodily rest.

CONGESTION OF KIDNEY.

¹ Previous to entering on Bright's disease, it is necessary to mention that the kidney, like other organs of the body, may be the seat of congestion, which may terminate at that stage, or go on to inflammation, and constitute what is termed "NEPHRITIS." Nephritis is, however, rare. "CONGESTION" may be the result of exposure to cold, of overdoses of special drugs, such as cantharides or turpentine, or it may appear during the various febrile and inflammatory diseases. It may be then considered "active congestion."

Experimental researches show that impediment or obstruction to the return of blood from the kidneys induces "passive congestion" of those organs, and if sufficiently intense and prolonged, albumen appears in the urine.

In disease, the obstruction or impediment may be in the chest from valvular heart-disease, emphysema, pleuritic

effusions ; in the abdomen, from a gravid uterus or other tumour obstructing the upward current of the venous circulation to the heart. Sometimes a cirrhotic liver compresses the inferior cava and so impedes the upward flow of blood.

When albumen is present, it is difficult to separate by any pathological standard such cases from congestion of the kidney and chronic Bright's disease, yet their clinical features are distinct. For congestion and chronic Bright's disease, to be afterwards considered, are diseases *per se*, affecting chiefly the kidneys ; while passive congestion seems to be only an adjunct to other diseased states of the system, or symptomatic of certain natural conditions, as pregnancy. The leading clinical distinctions of passive renal congestion are as follows : it makes no independent progress ; it varies with the obstructive process (the rising or falling of the venous obstruction) ; it does not cause a fatal termination ; it remains as it were subsidiary and only symptomatic.

Following from some of the above causes, or from the direct irritation of a renal calculus or embolus, or from inflammation of the bladder creeping along the ureter to the pelvis, infundibula, and calyces, the condition termed "PYELITIS," or inflammation of the lining membrane of the kidney, may be excited. The mucous membrane thus becomes congested, thickened, softened, and from its free surface is discharged mucus containing epithelium, pus corpuscles, and sometimes blood. If this affection is persistent, marked suppuration may be established, and even ulceration take place, not merely in the mucous membrane, but also in the substance of the kidney. This may be designated SUPPURATIVE NEPHRITIS. Supposing that the pus can escape easily by the ureter, and that one kidney is alone affected, the mischief may continue for years with little except local uneasiness, and it may ultimately become quiescent. In other cases, and whether or not the ureter is obstructed, an abscess may form, enlarging and burrowing in all directions, sometimes penetrating the diaphragm, pointing in the loins, bursting into the

peritoneum, or descending along the psoas muscle and pointing under Poupart's ligament.

Symptoms.—Pain and tenderness in the loins, increased by pressure or movement, irritability of the bladder, with the passage of urine clouded from the presence of blood, mucus, or albumen, characterise ACTIVE CONGESTION of the kidneys,—these phenomena being preceded by sickness, feverishness, and thirst. These symptoms are intensified in PYELITIS, and pus is also present in the urine; while, if SUPPURATIVE NEPHRITIS is established, the local pain will be greatly increased, and rigors and hectic fever will accompany, with, in most cases, a typhoid condition, suppression of the urine, and death by exhaustion.

Treatment.—In active congestion, if of independent origin, it is advisable to leech or cup the loins, and to follow this up by fomentations or the hot bath. The bowels should be kept freely open by a hydragogue cathartic, such as pulv. jalapæ co., if the urine is slight in quantity. If the pain is great, opium may in some cases be given. The treatment of pyelitis or suppurative nephritis is based very much on ascertaining the cause, and endeavouring to support the strength.

In passive congestion the remedies against the original cause of the congestion should be put in force. Passive congestion from lung and heart diseases can be relieved only by remedies acting on the original complaints. Thus absorbents or paracentesis for chronic pleurisy; digitalis to assist the labouring heart; fresh vegetables for scurvy; improved food and chalybeates for purpura and physiological albuminuria.

The special treatment for albuminuria with pregnancy is considered at page 346, under uræmia.

BRIGHT'S DISEASES.

The kidney has a thin translucent lightly-adhering capsule, and beneath this capsule is the kidney proper, containing a complicated and convoluted series of tubes lined with epithelium; and lying between the tubes,

supporting and binding them, is a thin delicate web of fibrous tissue, and an abundant supply of blood-vessels to enable it to perform its secreting function. Each and all of these various parts may be affected with disease, but, as can be conceived from the intimate union existing between them, one cannot be affected without the other sympathising, whatever may be the original starting-point. Diseases implicating the tubes, fibrous tissue, and blood-vessels, thus merge into one another.

The name Bright's disease is deservedly given in honour of the illustrious physician of Guy's Hospital, who, in 1827, threw the ægis of his name round all kidney affections associated with albumen in the urine.

ACUTE NEPHRITIS.

Synonyms—Acute Albuminuria, Acute Desquamative, Parenchymatous, Tubular, or Diffuse Nephritis, Acute Renal Dropsy, Acute Bright's Disease.

The kidney is always enlarged, sometimes to twice its natural size, its capsule easily stripped off, its colour in the earlier stage deep red, and the section dripping with blood; in the later stage, it is mottled red and white, and under the microscope there is observed an immense increase of the epithelial cells of the convoluted tubes, which are thus choked up to a greater or less extent, and compress the renal capillaries, while the intertubular stroma is unaffected. From this condition it may pass on to recovery, or remain what will be afterwards described as the **LARGE WHITE KIDNEY**; or the disease may terminate in death by dropsy or other intercurrent affection, as pneumonia, pleurisy, and pericarditis.

Causes and Symptoms.—It may be the direct result of cold or intemperance, or occur during convalescence from scarlet fever or other blood-poison. Fever, pain in the loins, and marked diminution of urine, characterise the early stages of this affection. The urine is also albuminous, smoky coloured or dark brown from the admixture of blood, and contains "epithelial" and "blood-

casts." The specific gravity is high from decrease of water and increase of solid constituents. Dropsy supervenes. If a favourable termination ensues, the urine becomes more abundant, the skin moist, blood, albumen, and tube-casts disappear, and convalescence and recovery are established in a varying interval of weeks or months. A large proportion—Frerichs says two-thirds—recover.

Treatment is based on obvious principles of inducing perspiration and relieving the overloaded tubes. Hence a warm blanket bath may be employed, the blanket being wrung out of warm water and wrapped round the patient, while an abundance of water should be drunk, and a mixture of acetate of potassium, citrate of potassium, and infusion of digitalis, ordered (F. 37). The bowels should also be freely acted on by jalap or elaterium (F. 27). An extemporised hot-air bath may be obtained in a private house by seating the patient on a wooden stool beneath which two or three lighted spirit-lamps are placed. Blankets should now be wrapped round the patient, and the head alone exposed. Perspiration is thus induced. A hot bath may also be employed for a similar purpose, the patient being placed in this with the water at a temperature of 100° Fahr., which should be gradually raised to 107° Fahr. Here he should recline as long as he feels comfortable, not beyond a full hour, and then be packed in previously-warmed blankets for two hours. He is then finally to be rubbed down quickly and placed in a warm bed.

A less efficient, but not to be despised method, is simple packing in wet cloths, which should be relied on solely if the temperature is very high, for the baths previously mentioned have been suspected of hastening dreaded uræmic convulsions.

Instead of "hard purging and sweating," some physicians advocate—1. No solid food, only milk and arrow-root; 2. Mild diuretics, such as the citrate or bitartrate of potassium, with a free supply of water; 3. The skin kept just moist; 4. A daily evacuation from the bowels. Dr. Bartholow of Philadelphia uses nitro-glycerine, the dose

of which is $\frac{1}{2}$ to 2 m. of the non-official liquor (1 gr. in 100 minims of rectified spirit) every three or four hours in acute cases immediately after the subsidence of the acute symptoms. Fuchsin or rosanilin hydrochloride has been found to check the secretion of albumen promptly by M. Bouchut of Paris. Dose, one grain thrice daily in aromatic water.

Locally dry-cup the loins and apply hot linseed-meal poultices. The diet should consist of milk, beef-tea, or nourishing soups. During convalescence all exposure to cold should be avoided, the wearing of flannel insisted on, and a mild preparation of iron, by preference the ammonio-citrate, given (F. 90). Change of air is also beneficial.

BRIGHT'S DISEASE.

Synonym—Chronic Albuminuria.—Three chief types are recognised as post-mortem appearances of those dying of Bright's disease.

A.—CHRONIC NEPHRITIS.—*Synonyms*—Chronic Parenchymatous, Tubular or Diffuse Nephritis, Large White Kidney of Nephritis.

The structural changes in the LARGE WHITE KIDNEY are similar to those described in the acute form of active congestion of the kidney, but advanced to a further stage. The kidney is enlarged and the capsule is easily stripped off. Patches of blood-vessels are seen on the white marbly surface. On section the cortical substance is observed to be greatly increased; its colour being "ivory white," or, if fatty transformation has ensued, "yellowish." The cones retain their usual hue, but they appear abnormally red, from the contrast they present to the white cortex.

The microscopic changes, as described by Professor Grainger Stewart, are essentially confined to the uriferous tubes. The epithelial lining is enormously increased in quantity, and thereby the tubes are distended and enlarged. The cells are swollen, opaque and granular, and often loaded with oily particles. In the pure form the interlobular tissue is not altered to any extent. Trans-

parent fibrinous effusion and blood are sometimes seen within the tubules. The Malpighian corpuscles are not often enlarged, but retain their normal size, and their capsules are thin.

The large smooth kidney generally remains smooth and enlarged until death occurs. Should the patient survive long enough, the enlargement gives place to shrinking, which is progressive, so that in some instances the weight of the kidney may be reduced to one ounce.

When this atrophic change is reached the capsule is thickened, and adheres to the surface of the organ, and a slight granular condition is observed. There is a relative increase also of the fibrous stroma, with a destructive and gradual absorption of the distended tubules and their epithelial contents.

When the large white kidney is infiltrated with fat, it constitutes one form of the "fatty kidney"—oily particles being found in great numbers in the substance of the epithelium and lying free in the tubules. Such a "fatty" change results more often from cold than from scarlatina.

*B.—GRANULAR KIDNEY.—Synonyms—*Chronic Interstitial Nephritis, Contracting Granular Kidney, Gouty Kidney, Cirrhosis of Kidney, Fibrosis of Kidney.

In this form the kidney is diminished in size, reduced in weight, and the colour is brown or brownish-red. The surface is rough with numerous rounded elevations, which vary in size from a pin's head to a hemp seed, or even a small pea. These rounded eminences give rise to the granular appearance. In contradistinction to what is observed in the "large smooth kidney," the capsule is adherent to the surface of the organ, so that in peeling it off the glandular surface is injured. On section, the cortex is visibly atrophied, as compared with the cones, and forms a thin rim of only a line or less in thickness round the bases of the pyramids. Its colour is red or brownish-red, and the texture is coarse and granular.

The entire organ is in fact tough and resistant, and its weight is reduced to two or three ounces or less. In that

form of granular kidney produced by gout, there may be seen, in the pyramidal portion, longitudinal white or yellowish streaks caused by a deposit of urate of soda. When a section of granular kidney is placed under the microscope it will be observed that there is manifest destruction of the secreting tissue, and this destruction is brought about by extensive wasting of the glandular structure proper. The Malpighian bodies are shrunk to half their size, and are unnaturally crowded together. The uriniferous tubes are altered. Some are stripped of epithelium and reduced to tubular threads; others, equally denuded, contain glassy cylinders; while others again are full of broken-up epithelium. Oil is sometimes found in the fibrinous exudation and disintegrated epithelium, but not so often or so abundantly as in the large smooth kidney. Between the wasted structures lies a large quantity of connective tissue, which gives the organ its peculiar resistance. The arteries show thickening of all their coats—the increase being specially marked in the muscular coat.

Sometimes the degeneration is not complete but partial, the sound portion being perfectly smooth with the capsule easily detached, while the diseased portion is granular and knobby, with the capsule firmly adherent. Dr. Bright's original description of the kidney is terse and complete, and not being clouded with redundant verbiage is easily remembered:—"The kidney is rough and hard, and gives resistance to the knife in attempting to cut into it. Numerous projections are seen on the surface, not much exceeding a pin's head. The tubular portion appears to be drawn near to the surface. IT APPEARS TO BE, IN SHORT, LIKE A CONTRACTION OF EVERY PART OF THE ORGAN, WITH LESS INTERSTITIAL DEPOSIT THAN IN THE LAST VARIETY."

C.—LARDACEOUS KIDNEY, or WAXY KIDNEY.—*Synonym*—Amyloid Kidney.

Externally the waxy kidney is smooth, and the capsule peels off easily. The organ is as a rule enlarged; occasionally it is diminished in size. On section, the cortex

is observed to be bloodless, of a white or yellowish colour, with a waxy smooth appearance like bacon-rind or white beeswax. On the smooth cut surface the natural appearance is altered, for it is dotted over with bright glancing points, which are the altered Malpighian bodies. The cones are unnaturally red and distinct. Under the microscope with a thin section, the waxy change is seen to affect first the Malpighian corpuscles, and when no reagent has been added they appear as shining particles with thickened capsules, the vascular tufts being greatly distended and having the characteristic reaction to be afterwards mentioned. In advanced cases the vasa afferentia, with the arteries and the capillary network of the cortex, and even the vessels of the pyramids, are similarly affected. Later on the epithelial cells of the uriniferous tubes are commonly shrunken and sometimes infiltrated with fatty molecules. Only rarely are they the seat of the waxy change, but the basement membrane of the tubes is frequently affected. Hyaline or waxy casts appear in some of the tubules.

It is to be noted that the liver and spleen are also usually enlarged and in a waxy condition when the kidneys are so affected.

Virchow considered that the violet colour produced by iodine and sulphuric acid when applied to a section of the waxy kidney, showed that it belonged to the same group as starch and cellulose, which give the same tint with these reagents. Later analyses show that the waxy kidney contains nitrogen, as much as 15 per cent, in almost the same proportion as the protein compounds. No sugar could be produced by boiling it with dilute sulphuric acid; but it yielded a violet colour with the cupro-potassic solution, dissolving completely in dilute caustic potash, and being precipitated from this solution in a white flock by acids. It thus resembled albuminous compounds, the exact proportion of carbon, hydrogen, and nitrogen being, according to Kekulé, in a selected specimen of lardaceous kidney, C. 53.58; H. 7.00; N. 15.4—nearly the same percentage as occurs in albumen. Virchow's term, "amyloid," is thus

by late investigations proved to be a "misnomer," and it sometimes leads to hazy ideas as to the connection between waxy degeneration and the (genuine) amyloid substance found in the healthy liver.

The student, after having read the description of the pathological changes in acute and chronic Bright's disease, should tabulate these changes—for this is a good aid to individual memories—under 1, colour; 2, size; 3, appearances to the naked eye on section; 4, microscopic changes of different structures of the organ.

THE LARGE WHITE KIDNEY,

following on the acute form or having a latent undetected origin, is attended with dropsy, the countenance being puffy and pasty. The urine is scanty, containing CASTS—EPITHELIAL, FATTY, OR HYALINE; and the specific gravity normal or rather high, with albumen always present.

The average age of the patient is twenty-eight years. Recoveries and relapses are frequent. In fatal cases the ordinary duration of the disease is under six months, and in exceptional cases it may extend over some years.

THE GRANULAR CONTRACTING KIDNEY

is associated with middle age, not youth, being most common about fifty years, and more frequently observed in males than females in the proportion of two to one. Its commencement is insidious, the early symptoms slight, the progress slow, and the disease may run a latent course for months or years. The first evidence of the disease may be frequent and severe headache, or simply hemi-crania, or loss of strength, or vertigo, palpitation, and difficult breathing. Any one of these symptoms occurring in a person of middle age is suspicious, and may attract attention to the kidneys. In others frequent micturition and some slight puffiness of the ankles lead to an examination of the urine, which is found to be copious in quantity (three to four pints), of low sp. gr. and with a

COMPARATIVELY SMALL QUANTITY OF ALBUMEN. THE TUBE-CASTS ARE FEW, AND, IF PRESENT, ARE CHIEFLY HYALINE OR GRANULAR, with but little epithelium or fat. In later stages the urine becomes scanty and the albumen more abundant. The general health gives way, the pallor becomes pronounced, chest and stomach derangements increase, and death ensues through exhaustion, or with symptoms of œdema of the lungs, uræmia, or other inter-current affection. As harbingers of speedy decease may be mentioned obstinate vomiting and diarrhœa, with itching of the skin and drowsiness. How the chronic nature of the disease gives rise to increase in the heart's structure is as yet an undetermined question; still, in nearly fifty per cent of the cases there is hypertrophy of the left ventricle, and also a peculiar form of retinitis. The most consistent explanation of the hypertrophy is given by Traube, who attributes it to increased tension in the arterial system, this tension of necessity taking place as soon as a great number of arterial branches in the kidneys, with the Malpighian tufts attached to them, become obliterated, thus reducing the channels through which the blood of the renal artery can drain away. The hypertrophy of the left ventricle he regards as being for some time a necessary and efficient compensation for the loss of renal secreting tissue, and so long as the hypertrophied heart labours energetically no uræmic symptoms occur, for an over-abundant secretion of urine is being carried on. To the high arterial pressure on the vascular tufts is also attributed the albuminuria.

Gull and Sutton go farther than this, and state that there is fibrous thickening of the coats of the small vessels through the whole arterial system, and thus deny the claim which the kidney has as the special causative factor of the ventricular hypertrophy. They state that this general arterio-capillary fibrosis leads to thickening of their walls, with loss of elasticity and subsequent wasting of the tissues, and so gives rise to the hypertrophy in question. See also page 246, under Arteritis.

THE WAXY KIDNEY

is associated usually with amyloid disease of other organs, as liver or spleen, and with a previous history of syphilis, caries, phthisis, long-continued suppuration, or other exhausting conditions. It is characterised by a large flow of urine, 100 to 200 ounces being passed in a day. THE URINE HAS A LOW SP. GR., WITH FEW TUBE-CASTS, GENERALLY HYALINE IN CHARACTER. The albumen is at first slight, but as the disease advances, the urine, as in the previous form described, becomes of higher sp. gr., and the albumen more abundant. Dropsy does not, until the late stages have been reached, form a prominent feature of the disease. The disease may not be recognised at first, and hence may extend over a series of years. Indeed, it seems to form a part of various constitutional states, and upon these its ultimate issue depends.

Treatment of the various forms of chronic Bright's disease requires careful management, though it is based on certain obvious principles, hygienic, dietetic, and medicinal.

All exposure to cold should be avoided, and, if circumstances permit, a residence selected in a mild and sheltered spot, or, what is still better in the more chronic forms, a sea voyage should be made. The patient should be habitually clothed in flannel, and moderate exercise, and the occasional use of warm baths and frictions to the skin should be insisted on. All authorities seem agreed upon abstinence from animal food and the taking of milk to the extent of five or six pints daily. A teaspoonful or more of lime-water to each pint prevents acidity. Vegetables and fruits are always beneficial, but those should be selected which contain least vegetable fibre, as potatoes, rice, and onions.

All spirits should be forbidden, but two or three glasses of claret or beer daily are permissible.

The constant draining away from the blood of one of its most important constituents necessitates the adminis-

tration of strengthening medicines, and experience has shown iron to be the best of these. The tincture often causes headache, and hence the citrate of iron and quinine, or the syrup of the phosphate or the iodide of iron, is recommended, and should be steadily persevered with (F. 76). Dialysed iron in 5-drop doses four or five times daily seems to suit well, and causes no indigestion or blackening of the teeth. No medicine yet discovered seems to have any effect in directly diminishing the quantity of albumen, and hence other treatment must be symptomatic. Dropsy is the chief symptom, and in private cases the most effectual way to combat the dropsical effusions is by means of hydragogue cathartics and warm baths—the patient entering the bath at a temperature of 98° F., which is gradually raised to 108° F., and remaining in it for half an hour, when he returns to bed and is enveloped in blankets; or, if circumstances and health permit, a Turkish bath should be taken every third day. Compound jalap powder and bitartrate of potash may be ordered twice or thrice a week, or Friedrichshall or Hunyadi Janos water. Latterly, to combat the increased connective tissue growth of the granular kidney, Bartels recommends the iodide of potassium, or doses of 20 to 30 grains given daily for a considerable length of time. Further, he advises the drug to be taken on an empty stomach, as it will then be conveyed in a more concentrated and active form to the kidneys.

On the question of diuretics opinions seem somewhat divided. Many object to them on physiological grounds, and others state they should be given not in the form of active diuretics, like squills, but as cream of tartar alone, or combined with digitalis. Thus a favourite remedy of Sir Robert Christison's was \mathcal{R} pulveris digitalis gr. i-ii. —potassii tartratis gr. lx. to gr. cxx. *M.*—"the powder thrice daily in water." Rayer recommends horseradish tea. English authorities seem unanimous in condemning all preparations of mercury, yet American physicians order in acute Bright's disease \mathcal{R} Calomelanos gr. ss., Sodii Bicarbonatis gr. ii. *M.*—one twice daily;

with R. Potass. Bitart. $\text{gr. } \text{ij.}$, Pulv. Jalapæ $\text{gr. } \text{viii.}$, Pulv. Cambogiæ $\text{gr. } \text{i.}$ M.—“one night and morning.” Such treatment, it is stated, never salivates.

By far the most potent diuretic that I have tried is Trousseau's wine. It is prepared from white wine, alcohol, dried digitalis leaves, squill bulbs, juniper berries, and acetate of potass. The method of preparing the wine is indicated under F. 40a. It is given in doses of three tablespoonfuls daily, and frequently succeeds in reducing dropsy when other remedies have failed.

Caffeinæ citras in 5-grain doses for a short time has sometimes a surprising action.

In extreme dropsy punctures or incisions may be made into the skin of the legs or scrotum. Dr. Southey's drainage tubes can be specially recommended as safe and useful. These consist of a perforated needle, which is inserted into the swollen legs, and to this gutta-percha tubing is attached and placed in a vessel below the bed. The needle should enter the skin after having pierced a small piece of boracic lint placed on the surface. All chance of erysipelas is thus avoided.

THERE CAN BE NO DOUBT THAT OPIATES SHOULD NOT BE GIVEN. This statement includes preparations of opium, chloral, belladonna, and stramonium. In extreme restlessness the bromides of potassium and ammonium may be administered in large doses. Should excessive drowsiness result from their use, it may add to the danger of the poison of the disease, and should be combated by granular effervescent caffeinæ citras $\text{gr. } \text{v.}$, or iodide of potassium $\text{gr. } \text{vi.}$, thrice daily. Hoffman's anodyne (sp. æth. co.) may sometimes be substituted for the bromide of potassium, and a few drops of ether may be inhaled when there is great distress in breathing.

In addition to the diseases mentioned, it may also be stated in general terms that the kidney or kidneys may be attacked by CANCER, either primary or secondary, usually of the encephaloid form, and that the leading symptoms of the former are a tumour in the abdomen,

sometimes very large, and hæmaturia ; that TUBERCLE or HYDATIDS may also originate in the organ, exhibiting in neither case very well-defined symptoms, though resulting fatally in both ; that when any impediment exists to the flow of urine from the kidney, DROPSY of the kidney, or HYDRONEPHROSIS, may ensue, through dilatation of the pelvis, with atrophy of the cones or whole substance of the organ ; and that, finally, one or both kidneys may be shifted from their original position, occasioning the condition known as MOVABLE KIDNEYS. To enter, however, further into details would be foreign to the object of this handbook.

SUPPRESSION OF URINE.

Prof. Grainger Stewart states that suppression of the secretion of urine arises under two conditions—1st, when there is obstruction in the line of outflow ; 2d, when there is some fault in the kidney itself.

1. OBSTRUCTIVE SUPPRESSION.—This is most commonly due to the impaction of a calculus in one ureter when the other kidney has been permanently destroyed ; or from the presence of a tumour, as of the bladder and uterus, pressing on both ureters.

Urine in such cases is passed in small quantities, pale, and of low specific gravity. When suppression is complete, the duration of life appears to vary from nine to eleven days, being preceded for two days by muscular twitchings, contraction of the pupils, drowsiness, and rarely convulsions, with no dropsy or urinous odour of the breath.

2. NON-OBSTRUCTIVE SUPPRESSION.—In the course of acute Bright's disease complete suppression of urine may take place. It may also occur in the cirrhotic or granular form of Bright's disease, as a consequence of injuries to the urethra, and in the algid stage of cholera.

Treatment.—This consists in giving hot baths and local fomentations, avoiding the administration of all powerful diuretic medicines, which would only aggravate

the condition of matters. In cases of obstructive suppression kneading the abdomen has been successful, and the passing of a sound into the ureter of a female has been favourably reported on.

URÆMIA.

In the course of Bright's disease, or any other state attended with albumen in the urine, a group of phenomena termed "uræmic" is sometimes observed, owing, it is supposed, to a poisoned state of the blood. Generally uræmic attacks begin insidiously with headache and dimness of vision, followed by convulsive paroxysms, profound insensibility, stertorous breathing, pale face, and dilated pupils.

The absence or presence of consciousness in uræmic attacks has led some to recognise two forms of uræmia, viz. chronic and acute.

The former—chronic—is sometimes the termination of chronic Bright's disease, and rarely attends the early stage of the inflammatory form. In such cases the patient may be roused at times to answer questions, but his articulation is thick and indistinct. This ability to be roused terminates, after a varying period of hours or days, in stertorous breathing, deepening coma, and death.

"Acute uræmia" is divided again into three forms—comatose, convulsive, mixed—terms which explain themselves.

Thus the "comatose condition," after headache, giddiness, affection of sight and vomiting, is quickly developed, and death may occur in a few hours, or the patient may rally and be free from other attacks for some time. Sooner or later, however, other uræmic attacks supervene, and end in death. This form may be seen in all the varieties of Bright's disease. As a rule it is most frequent in the inflammatory and granular kidney.

"Convulsive" uræmic attacks simulate epileptic seizures, affect certain groups of muscles, and are sometimes unattended by loss of consciousness. They may

be single or occur rapidly in succession, in which latter case a fatal termination by coma supervenes. They are seen most often in those forms of Bright's disease spoken of as the cirrhotic and inflammatory types.

"Mixed" uræmic convulsions are observed—

1. When sudden coma occurs with convulsions.
2. When the ordinary symptoms are replaced by restless delirium—"delirious uræmia."
3. When breathlessness and dyspnoea are manifested without there being any changes detected in the lungs or heart—"dyspeptic uræmia."

4. The "articular uræmia," described by Jaccoud, presents many of the features of acute rheumatism.

Much controversy and many theories have been excited by uræmia, and two explanations stand prominently forward—the "mechanical" and the "chemical." Each of these has had prominent and able supporters. In this country Owen Rees, in Germany Professor Traube, adopt the "mechanical theory," which, briefly stated, makes the symptoms of "uræmia" depend upon the wateriness of the brain in many cases of "uræmia." This wateriness, it is suggested, is due to a sudden increase of blood pressure, and of the proportion of water in the blood, and leads to œdema of the brain, and the consequent convulsions seen in uræmia. This theory is disproved by well-marked cases of uræmia, where post-mortem evidence failed to show the encephalic œdema.

The "chemical theory" is old, and is embraced in the word uræmia (*οὐρον*, urine; and *αἷμα*, blood). The original idea of Willis was that the special poison in the blood was urea. Frerichs supposed that urea is harmless, and that its conversion into carbonate of ammonium occasioned the uræmic phenomena. The more recent experiments of Oppler and Zalesky indicate that neither of these theories is correct, but that the chief poisonous agents are the accumulation in the blood of the first products of tissue-change—creatine, creatinine, and other extractives—which are converted in the kidneys into urea and uric acid. The question is not yet satisfactorily

determined; but in all probability the chemical theory, however it may be interpreted, is the correct one, viz. the process that is dependent on the retention of some excrementitious material, which should be passed by the urine. Uræmia has patent symptoms during life pointing to a nervous origin; but, like some other diseases of a similar kind, there is an absence in the nervous centres of anatomical changes explaining their nature. Hence the causation of uræmia may be said at present to be a matter of theory and uncertainty.

Treatment.—When an uræmic attack has actually begun our resources are but limited, especially in anæmic patients, and consist chiefly of anæsthetics, and for this purpose inhalation of chloroform may be tried, or better still, chloral injections. The quantity of chloral in the injection should be 45 grains to an adult, or 15 to a child, and it may be repeated if desirable. Withdrawal of the ascitic fluid, and the subcutaneous injection of digitalin proved successful in one case under my care, and doubtless the injection of pilocarpinæ nitras gr $\frac{1}{4}$ in 3 minims of water must, on physiological grounds, be useful. Should the attack be sudden, and the blood not greatly impoverished, as sometimes happens in pregnant women, free venesection has much to recommend it, and should not be dismissed as absurd simply because it was the panacea of our forefathers. In all the forms of Bright's disease I have, by means of the ureameter,¹ carefully noted the quantity of urea excreted daily, and when this notably diminishes I suspect the probability of an uræmic attack, and endeavour to ward it off by drastic cathartics and copious perspiration. Elaterinum, in combination with colocynth, may be selected as the best drastic cathartic for this purpose (F. 27), and pilocarpine injections may be relied on for producing diaphoresis. Benzoic acid, on the supposition that ammonia is the cause of the convulsions, has likewise been recommended in 7-grain doses every three hours. The poisonous alkali, it is thus fancied, may be converted into a harmless acid and a salt.

¹ See Appendix, p. 533.

A word or two here may be fitly added with regard to puerperal convulsions, which seem to be attendant on the albuminous state of the urine. These may be divided into three great classes—

1. The convulsions which commence before labour begins.
2. Those which come on during labour.
3. Those which succeed delivery.

In the first series, several observers state that chloral arrests the convulsions. In the second, the administration of chloral has been attended with excellent results. At the same time labour should be finished as soon as possible by the forceps or otherwise. In the third, one dose of the same drug may terminate the convulsions. How or in what doses are you to give it? 60 grains if you wish strong action, and follow this up by 15 grains if it seems to lose its effect. It should not, however, be pushed beyond 120 grains in the two hours. Some have recommended giving it in a pessary by the vagina. The efficacy of this is doubtful. If the patient cannot swallow, it must be administered by injection.

HÆMATURIA,

as its name implies, means the admixture of blood with the urine; and this mixture is easily recognised by the colour it imparts to the secretion, unless the quantity is very small, when it may require the aid of the microscope to detect it. Blood or blood-pigment can be detected by Heller's test. This consists in adding caustic soda solution to urine in a test-tube, and boiling. The earthy phosphates precipitate and entangle the hæmatin, which is thus carried to the bottom of the tube as a sediment of a brick-dust or bright red colour. The guaiacum test consists in placing a few drops of urine in a test-tube, adding one drop of tinctura guaiaci, and shaking up with a few drops of ozonic ether. The ether dissolves the precipitated resin, or goes to the surface and carries with it a distinct bluish colour if blood be present. This

is due to the ozonising power of the blood, and this property is destroyed by adding to the urine containing blood a small quantity of quinine. Blood in the urine may originate from different sources, which, as a general rule, can be recognised from the following considerations. If from the kidneys it is found equally diffused, giving to the urine a smoky reddish tint, and after standing some time a grumous-coloured deposit subsides. If from some other part of the urinary tract—*e.g.* if it comes from the ureter, bladder, or urethra—the colour is more bloody, more red, perhaps affecting only the part of the urine which is last voided in micturition, and frequently distinct clots are observed in the deposit. If the clots are large and readily distinguishable, and there is no history of an injury, we may safely infer that the blood is not from the kidney or the renal vessels proper; for, in true hæmorrhage from the kidney, the coagula are formed within the renal tubes, and betoken their origin by the cylindrical casts and entangled blood-cells which they present. All urine containing blood is necessarily more or less albuminous.

By far the most common cause is congestion, due to some blow or injury in the renal region. It may also arise from acute Bright's disease, from malignant disease of the kidney or bladder, from the presence of a calculus either in the kidney, ureter, or bladder; or from the taking of irritating medicines, as turpentine or cantharides. Sometimes it is symptomatic, and dependent on other than urinary diseases. Thus it is seen in purpura and scurvy; or it may be found in yellow fever, cholera, or any of the eruptive fevers; and, when detected in the course of these diseases, the prognosis is most unfavourable. At other times it is supplementary either to a normal state or to a diseased condition, *e.g.* it may accompany menstruation in a woman, or a hæmorrhoidal flux in either sex. The endemic hæmaturia of the Mauritius and Brazil is dependent on the presence of a small parasite which infests the mucous membrane of the pelvis of the kidney, or the bladder.

Hæmorrhage from the bladder, due to acute cystitis, fungoid growth, or calculi, is usually recognised by symptoms referred to that organ, viz. very frequent micturition and pain in the hypogastrium. Urethral hæmorrhage is known by the escape of blood during the intervals of micturition.

Treatment will vary with the causes and circumstances of the hæmorrhage, but when our object is to treat the hæmaturia for itself—to stay the loss of blood—perfect rest is absolutely necessary, and the application of ice to the seat of the hæmorrhage. Thus if the kidneys are the seat, apply ice to the loins; if the bladder, to the hypogastrium and perineum. In addition to this local application give astringents internally, *e.g.* acetate of lead, gr. iii., pulv. opii gr. $\frac{1}{4}$, in a pill every two hours, until six or eight doses have been administered; infusion of matico, \mathfrak{z} i. thrice daily; ol. terebinth. m. iii., mist. amygdalæ \mathfrak{z} j., every four hours; or injectio ergotini hypodermica may be used.

In severe vesical hæmorrhage a solution of alum, 20 grains to the pint of water, may be injected into the bladder.

INTERMITTENT HÆMATURIA.

Synonyms—Paroxysmal Hæmaturia, Paroxysmal Hæmatinuria, Paroxysmal Hæmoglobinuria.

Intermittent hæmaturia is a curious disorder, to which attention was first drawn by Dr. George Harley in 1865. The peculiar feature of the disease is the paroxysmal passing of dark-coloured urine, containing not blood, but merely the colouring matter of the blood—hæmatin. A sense of shivering or cold about the loins precedes the paroxysm, which is sudden. The intervals between these are irregular, and there is no certainty about their occurrence; for sometimes the urine at one micturition is clear, and at another bloody-coloured like porter. The patient first experiences coldness of the extremities followed by general chilliness, accompanied by a feeling at the same time of malaise and a desire to stretch himself or yawn.

Then is experienced a dull heavy pain in the loins, sometimes with tenderness over the region of the kidneys. These symptoms subside in a period varying from thirty minutes to two hours, after the passage of the dark-coloured urine, and the patient feels well until the recurrence of the next paroxysm. Microscopically, the urine presents chiefly an immense mass of amorphous granular matter, with dark-coloured granular tube-casts. The prognosis is favourable, though the duration of the disease cannot be defined. It gives the usual reactions of blood with guaiacum and Heller's tests.

In a case reported by me in the *Lancet*, January 1879, there was a fall of temperature preliminary to the rise when the paroxysm occurred.

The liability to paroxysmal hæmoglobinuria seems to be confined to males, age being from 20 to 48.

Cold is generally the exciting cause, and sometimes there is a history of malaria or of a previous injury to the back.

The pathology is obscure, but it seems to originate in the nervous system, and to be connected in some way, not precisely understood, with ague.

Treatment.—During the cold stage send the patient to bed, and administer warm stimulating drinks. Tonics, as iron and quinine, are also indicated (F. 76). Gull recommends ℥ii. of tinct. cinch. co. three times a day; Hassall, gallic and tannic acid powders night and morning; Habershon, quinine and arsenic; while Begbie found attacks prevented by 20 grains of sal-ammoniac three times daily.

CHYLURIA (χυλός, chyle, and οὖρον, urine.

Synonym—Chylous urine)

was first recognised and described by Dr. Prout, and has since been investigated by other observers. It may be defined to be a diseased condition, occurring in tropical and subtropical climates, which shows itself by a milky appearance of the urine when voided. After settling the urine coagulates into a tremulous mass like *blanc mange*, and then liquefies into a creamy scum with a brownish sedi-

ment—the colour of the sediment being due probably to blood. Lately a microscopic nematoid entozoon (*filaria sanguinis hominis*) has been found in the blood and urine of persons affected with the disease.

Symptoms.—There seem to be no marked premonitory symptoms of chyluria, yet previous to voiding urine the patient may complain of a dull aching pain in the loins, along the ureters and over the bladder; or along the course of the urethra in males. With this there may be marked general debility and lowness of spirits. The urine presents the colour already mentioned, and frequently a strong milky or whey-like odour is perceived, which heat increases.

Sometimes during micturition the flow of urine is stopped by the blocking up of the urethra with clots. The sp. gr. may range from 1007 to 1020. Shaken up with ether the urine loses its milky aspect, and when nitric acid and heat are applied a precipitate almost invariably results. These characters evince the presence of fat, albumen, and fibrin. *No casts* have, however, been detected, and the fat chiefly characterises the urine passed after meals.

Chylous urine is more common in adults than in children, in females than in males, and its presence is not inconsistent with fair health. The disease runs a chronic course, and intermissions are not uncommon. A cure, however, can hardly be prognosticated, as the symptoms are apt to return. Patients in otherwise good health with chylous urine sometimes die suddenly from no recognised acute disorder. In persons afflicted with chyluria, who have died, no kidney disease has been detected. Nothing has been found in any of the organs or tissues suggestive of the cause of the urinary derangement, except the fact that all the vessels—arteries as well as veins—in their minutest ramifications contained the filaria.

The parasite, as a rule, is found equally in the blood and urine when the patient is alive. Its average length is $\frac{1}{75}$ " = (0·34 mm.); its breadth $\frac{1}{3500}$ " = (0·007 mm.), or equal to the diameter of a blood corpuscle. It is enclosed in a transparent tubular sac, which is extremely delicate

and translucent, and in which the parasite can be seen to contract or elongate itself. After death the worm may occupy the whole of the sac, or it may shrink and leave the tube empty at one or both ends.

Pathology.—No satisfactory theory accounts either for the presence of the parasite or the chylous urine. Some state that there is a direct communication between the chyle-carrying vessels and the urinary tracts; others consider it due to fatty blood, this being averred to be the normal condition of the blood after partaking of food, which in the disease in question is made permanent by derangement of the digestive organs, notably the liver. Dr. Roberts thinks that one at least of the forms of chyluria may be due to a sort of eczema of the urinary tract, resulting in hypertrophy of the lymphatic channels, and subsequent acquisition by them of glandular functions.

Treatment.—The disease has neither been modified nor cured by any known remedy. Perhaps the most satisfactory results have followed the administration of large doses of gallic acid— \mathfrak{z} i. to \mathfrak{z} ii. a day.

BILHARZIA HÆMATOBIA.

This parasite was discovered by Bilharz while investigating diseases of the Egyptians, hence the name given to the disease by Cobbold, the English authority on anthelmintics.

The parasite is an elongated, soft-skinned, bisexual entozoon, three or four lines in length, of the nematode or fluke kind. It inhabits the branches of the portal system and the minute veins of the pelvis of the kidney, ureter, and bladder. The parasite is often seen at the autopsies of Egyptians.

In the intestine it gives rise to symptoms of indigestion; in the bladder it causes injected and ecchymosed raised patches, varying from the size of a lentil to that of a shilling, covered with a tough mucus, or with grayish yellow exudation, which contain masses of ova.

When it invades the pelvis and ureter of the kidney its

effects are most destructive, for it leads to narrowing of the ureter at the affected spot. The urine accumulates behind this, and hydronephrosis may result in pyelitis.

Sometimes, on masses of ova, urinary concretions are formed leading to calculi.

The direct signs of the parasite are hæmaturia and disordered health.

The parasite probably causes the endemic hæmaturia of different countries, as at Cape Colony, Mauritius and other hot climates. The parasite does not seem to be communicated by the husband to the wife, as the wives of infected husbands have healthy children. Probably the parasite enters the body from the person attacked drinking infected water, or eating salads to which the ova or embryos adhere.

Sometimes it seems to attack a person while bathing, attaching itself to the skin, and so entering the circulation.

Treatment.—A draught of ext. filicis liq. xv. m., ol. terebinth. xv. m., sp. chloroformi m. v., mist. tragacanthæ ad ʒii., according to Dr. Harley, brought away large numbers of the ova when given every morning. When the bladder is alone implicated, the same authority obtained the best results from injections of 20 to 30 grains of the iodide of potassium in 5 ounces of tepid water every second or third day.

Prophylactic measures against endemic hæmaturia are—

1. Water conveyed in covered channels from its source to its destination, so that the parasite may be prevented entering it.

2. Drinking-water should be filtered.

3. Uncooked salads, molluscs, and smoked fish, should be carefully avoided.

GRAVEL, RENAL CALCULUS, OR RENAL COLIC.

Sometimes concretions of crystalline or amorphous sediment form in the pelvis of the kidney, and are accompanied with severe pain in their passage along the ureter

to the bladder. There are also a frequent desire to micturate, retraction of the testicle, nausea, and vomiting, intense relief being obtained whenever the substance reaches the bladder. This may be termed a "fit of the gravel." When there is merely gritty matter or sand, no pain whatever may be experienced. The most common forms of gravel are urate of ammonia, uric acid, triple phosphate of ammonia and magnesia, and oxalate of lime.

Treatment varies with the nature of the deposit. Vichy or Carlsbad waters and alkalies are useful when the urates predominate; if phosphates, nitro-muriatic acid and a generous diet; if oxalates, dilute the urine by drinking plenty of cold water, which must not contain much lime, and avoid all saccharine substances.

During the passage of a calculus employ a warm bath, afterwards poultices or fomentations to the loins, and give barley-water to drink, along with spiritus ætheris nit. and vin. ipecac. To relieve the pain, give morphia subcutaneously; sometimes chloroform is necessary (F. 39, 40).

DISEASES OF THE NERVOUS SYSTEM.

THE nervous system may be considered, as a whole, under the following heads (according to Dr. Bastian):—

1. The Cerebro-Spinal System (or Nervous system of animal life).
 - A. The Encephalon.
 - B. The Spinal Cord.
 - C. The Encephalic and Spinal Nerves.
2. The Organic System (or Nervous system of vegetative life).
 - A. The Pneumo-gastric or Vagus Nerves.
 - B. The Great Sympathetic System (with which is included the Vaso-Motor System of Nerves).

It must be remembered that this division, though natural, is also artificial. No broad line of demarcation can be laid down between the two great systems noted. For the vagus nerves and the vaso-motor system have an encephalic origin, though the distribution is connected with the sympathetic system; and the sympathetic system is connected at intervals with the whole cerebro-spinal system, from the base of the brain to the lumbar enlargement. This is effected by connecting filaments passing between it and the anterior spinal nerves, some of these filaments being afferent, others efferent.

The direct consequences of the relation between the pneumo-gastric, the sympathetic, and the cerebro-spinal systems, lead to clinical features recognised in disease, as when the cerebro-spinal system is attacked in one of its centres. Thus if the medulla oblongata be injured by disease or accident, grave disturbances ensue with regard to the heart and respiratory processes; injury to the fourth ventricle may occasion an excessive flow of urine—diabetes; or central encephalic mischief may be revealed by vomiting.

Again, the relationship of the systems may be evidenced centripetally instead of centrifugally. Thus the passage of a renal calculus down the ureter may be evinced by "convulsions;" liver complaints and disordered digestion may induce a diseased mental condition—"melancholia;" irritated states of the ovary or disordered menstruation may give rise to the distressing features of nymphomania.

The knowledge of the diseases of the organic nervous system is at present very defective. The difficulty shows itself in this way—Where does the disease commence? What is its starting-point? We observe certain symptoms during life. Do these depend **PRIMARILY** on the implication of the cerebro-spinal system in the encephalon, or are they due to the functions of the sympathetic being interfered with **PRIMARILY**, this influence then **RADIATING** upwards to encephalic centres? Do Addison's disease, leucocythæmia, diabetes, chlorosis, and other anæmic conditions depend directly on morbid conditions of nerve

centres in the sympathetic system, or are these centres implicated by the higher nerve centres with which they are in connection?

Moreover, if obscurity exists with regard to diseases of the cerebro-spinal nervous centre, how much greater is the darkness when the nervous system of organic life is implicated. The centres of the nervous system of organic life are scattered. They are not limited to one area, generally are not minutely inspected at post-mortem examinations, and deviations from the condition of health may and do escape the keen eye of the most practised pathologist and microscopist.

After these preliminary observations we shall now speak of the anatomy of the brain in so far as this bears upon disease. Recent researches, especially those of Ferrier, have conclusively shown that there are localised areas in the brain, disease of which gives rise to certain symptoms during life. Physiological experiments show that the brain may be divided into different areas having different functions; yet, while this is the case, it is no less true that the brain acts as a whole, and it is not easy to distinguish between "the effects directly dependent on the diseased areas and those due to the indirect influences exerted on the functions of the neighbouring organs and on the brain as a whole." Moreover, it is difficult to define the lesion when we read accounts of post-mortems stated in vague and inexact phraseology, or from these to form conclusions coinciding with physiological experiments.

Yet, so far as can be seen at the present time, we may say THAT THE BRAIN IS DIVIDED INTO A MOTOR AND A SENSORY ZONE. The "motor zone" includes the convolutions bounding the fissure of Rolando, viz. the ascending parietal convolution, the postero-parietal lobule, the ascending frontal and the posterior extremities of the three frontal convolutions, and internal surface of the same convolutions or paracentral lobule.

In this zone are DEFINED CENTRES FOR THE MOVEMENTS OF THE LIMBS, HEAD, EYES, MUSCLES OF EXPRESSION, AND THOSE OF THE MOUTH AND TONGUE.

The centres of the leg and foot are situated in the postero-parietal lobule, those for the arm in the upper third of the ascending frontal, those for the hand and wrist in the ascending parietal, those of the facial muscles in the middle third of the ascending frontal and base of the second frontal, those for the mouth and tongue at the lower third of the ascending frontal and the base of the third frontal, and for the platysma at the lower extremity of the ascending parietal, just posterior to the mouth-centre.

The posterior third of the upper frontal convolution and corresponding part of the second frontal contain the centre for the lateral movements of the head and eyes.

Now, if we look at diseases or injuries affecting these centres we find that IRRITATIVE LESIONS of the MOTOR ZONE proper, such as syphilitic lesions, tumours, spiculæ of bone, depressed fractures, thickening of membranes, cause CONVULSIONS which may be limited to one limb or one group of muscles WITHOUT LOSS OF CONSCIOUSNESS; or they affect the whole of the opposite side with loss of consciousness; or become more or less two-sided, as observed in idiopathic epilepsy.

Should these convulsive phenomena always begin in the same way, and if they frequently remain localised in one limb or one group of muscles, and especially if paralytic symptoms manifest themselves, the EXACT POSITION of the LESION in the OPPOSITE HEMISPHERE may be correctly diagnosed.

Destructive lesions of the motor zone cause general or limited paralysis on the OPPOSITE side of the body, according as the lesion affects the whole zone or a special area. Thus hæmorrhage, if considerable, may affect the whole zone with a destructive lesion, and the result will be complete hemiplegia of the opposite side; or, embolism or thrombosis of the arteries derived from the Sylvian artery of the middle cerebral may cause a partial lesion only, as evidenced by partial paralysis.

It is to be noted as a point of diagnosis that the electro-contractility and nutrition of the muscles are NOT impaired by paralysis of cerebral origin. The state-

ment is true with regard to electro-contractility, but it is not absolutely true when it refers to nutrition, for frequently after a long time the nutrition of the muscles suffers, and contraction ensues from descending sclerosis of the motor parts of the crura and the lateral tracts of the spinal cord. Occasionally also from limited destructive lesions of the cortical motor area, complete hemiplegia may occur on the opposite side, not, however, of a permanent nature. For in such cases, if recovery takes place, motion again returns, except to the parts supplied by the limited motor area, which is through disease permanently impaired. The result is technically termed a **MONOPLÉGIA** or **DISSOCIATED PARALYSIS**, and thus we may observe, from a limited destructive lesion of certain areas, paralysis of the arm, or of the arm and face, or of the leg and arm, or of the face alone, or of the lateral movements of the head and eyes. If these limited paralyses are followed by other attacks, then complete hemiplegia may result, and hemiplegia following on a limited monoplegia is a **SURE** indication of cortical disease. Destructive lesion of the mouth-centre on one side does not cause paralysis of articulation, because each centre of the mouth and tongue has a bilateral influence. On the other hand, destructive lesion of the third frontal convolution (Broca's region) in the left hemisphere causes aphasia without paralysis of articulation.

SENSORY ZONE.—Various experiments on the brains of monkeys have convinced Dr. Ferrier that, in regions lying posterior to the motor zone, there are differentiated centres of sight, hearing, touch, smell, and taste. The sight centre is situated in the angular gyrus and embraces also the occipital lobe—the occipito-angular region; the centre of hearing is localised in the superior temporo-sphenoidal convolution; the tactile centre is situated in the hippocampal region; while the centres of smell and taste are situated together at the lower parts of the temporo-sphenoidal lobe. Destructive lesions of these sensory centres must be bilateral; if simply one-sided, they are, so far as at present known, unaccompanied by any

objective symptoms. Further, no secondary descending degeneration of the spinal cord has been observed in these cases.

The pathological evidence bearing upon the above dogmatic statements is as yet in its infancy, but facts are accumulating, though slowly, to bear out the assertions given. For the researches of Türck and Charcot show that destructive lesions of the posterior third of the internal capsule, external to the optic thalamus, cause hemi-anæsthesia of the opposite side of the body. In what is termed hysterical hemi-anæsthesia the same symptoms are observed as in hemi-anæsthesia of organic origin. For, in this condition, there is a loss of tactile sensation, and more or less complete loss of sight, hearing, smell, and taste, on the side opposite the lesion.

The affection of sight, which is not accompanied by any ophthalmoscopic change, is characterised by dyschromatopsia, and a remarkable contraction of the field of vision. "The loss of hearing is very marked, if not absolute, and similarly as regards smell and taste."

The lesion seems not an affection of sensory centres, but simply a solution of continuity of the centripetal paths, which radiate out into the differentiated sensory centres of the cortex. So also may be interpreted the loss of smell and taste, resulting from a blow on the occiput or vertex. This is probably due to injury through a counter-stroke directed to the centres of smell and taste, which are situated in such a position as to be influenced by violence so directed.

IRRITATIVE LESIONS.—There is good reason for believing that certain sensory hallucinations of insanity, as also the auræ in certain cases of epilepsy ushered in by such subjective sensations as flashes of light and colour, loud sounds, and disagreeable tastes and smells, are results of some morbid irritation of the sensory zone.

Certain points alluded to in the preceding remarks pave the way for the consideration of facts connected with brain disease. **THUS, PARALYSIS FROM BRAIN DISEASE AFFECTING ONE CEREBRAL HEMISPHERE IS OBSERVED ON**

THE OPPOSITE SIDE OF THE BODY. This broad statement is explained by the fact that the FIBRES conveying the will and emotional impulses to the muscles DECUSSEATE in the MEDULLA OBLONGATA. There are indeed a few cases recorded where paralysis existed on the same side as the cerebral lesion, and it is hard to understand how this should be, unless we believe that either errors exist in the history of the cases during life or that a false impression was taken of what was seen at post-mortem examinations.

Either the right or the left cerebral hemisphere may be the seat of the lesion. Great facts are associated with this statement. For, lesions of the left side are more often associated with disorders of speech than those of the right. Lesions of the right hemisphere are more frequently and suddenly fatal than those of the left; and, if not immediately fatal, they are apt to be associated afterwards with acute sloughs on the parts exposed to pressure on the paralysed side.

HENCE, THE OCCURRENCE OF BED-SORES IS MORE TO BE APPREHENDED FROM CEREBRAL LESIONS ON THE RIGHT THAN ON THE LEFT.

Convulsions at the onset are more common, and subsequent tonic spasms of the paralysed limbs are also said to be more frequently associated with LEFT- than with RIGHT-sided paralysis.

Congenital atrophy of one hemisphere, or atrophy occurring in early infancy, is more often associated with left- than with right-sided paralysis.

DISEASES OF THE CEREBELLUM.—The diseases of the cerebellum are more obscure than those of the cerebrum. While this is the case, it is generally acknowledged that the cerebellum has to do with motility (movement), and with the higher co-ordination of the muscular acts. Moreover, atrophy of one hemisphere of the cerebrum is associated with atrophy of the other half of the cerebellum. The presumption therefore is that cerebellar disease exists with paralysis of the same side of the body.

If, clinically, we find cerebellar disease exist with

paralysis on the opposite side of the body, we may attribute this to the pressure which structural diseases of the cerebellum are apt to occasion on the pons and medulla of the same side.

SPINAL CORD.

The spinal cord is the great medium for conducting nervous energy from the encephalon to the body. It is not a single organ, but is complex in structure and function. It serves as a medium to convey from the cerebrum motor and sensory impressions. It is continuous with the medulla oblongata, and begins at the upper border of the first cervical vertebra, and ends in a pointed extremity opposite the upper part of the second lumbar vertebra. In its whole course it is enclosed within the spinal column, and is invested by two membranes, "pia mater" and "arachnoid." Beneath the latter membrane, and in the meshes of the pia mater, lies a certain amount of what is termed "cerebro-spinal" or "subarachnoid fluid." Outside the arachnoid, and enveloping the cord more loosely, is the firm spinal "dura mater."

ANATOMICAL STRUCTURE.—The anatomical structure is similar throughout the whole extent of the cord. It is double. The two halves are marked off from each other by a longitudinal fissure anteriorly and by a septum of connective tissue posteriorly. Each half contains a mass of grey matter. These grey masses are turned back to back, and are made continuous by a bridge of nervous matter constituting "THE GREY COMMISSURE."

In front of this bridge of grey matter lies some white matter which forms the "WHITE COMMISSURE."

Through the centre of the grey commissure runs a fine central canal—"THE CANAL OF THE CORD"—lined with a layer of epithelium-like cells.

The thick anterior extremity of the grey matter in each half of the cord is known as the "ANTERIOR CORNU," and the much thinner posterior extremity as the "POSTERIOR CORNU." The posterior cornu approaches near to the surface of the cord in the posterior lateral region,

and is here joined by the posterior roots of the spinal nerves. Their points of entry on each side divide the white substance of the corresponding half of the cord into posterior and antero-lateral columns. The portions of the white substance of the cord lying behind and

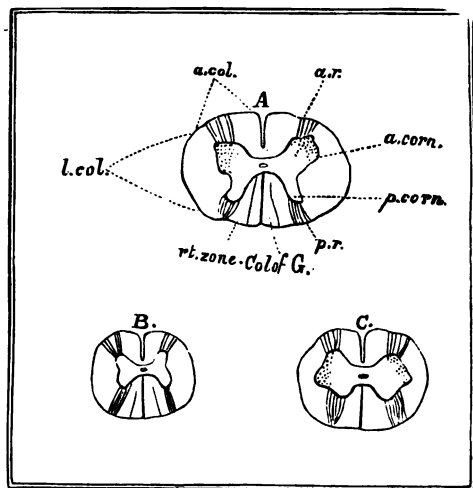


Fig. 17.

TRANSVERSE SECTION OF THE SPINAL CORD ($1\frac{1}{2}$ Natural size).¹

A. Through middle of cervical swelling; *a. col.*, anterior column; *l. col.*, lateral column; *rt. zone*, root zone; *col. of G.*, column of Goll; *a. r.*, anterior roots; *p. r.*, posterior roots; *a. corn.*, anterior cornu; *p. corn.*, posterior cornu. B. Section through mid-dorsal region. C. Section through middle of lumbar region. (Bastian.)

between the posterior roots constitute the "TWO POSTERIOR COLUMNS," each of which is again subdivided by a slight superficial fissure into an external tract or "ROOT-ZONE," and an internal wedge-shaped portion or "COLUMN OF GOLL."

The portions of the white substance which on each side

¹ This diagram represents the anatomical structure of the spinal cord as explained in the text.

lie in front of the posterior roots constitute "THE ANTERO-LATERAL COLUMNS."

There is no real line of demarcation to define the bounds of the anterior and lateral columns respectively, for the anterior roots are connected with the anterior cornua in a diffuse manner, and do not form a compact bundle like that formed by the fibres of each posterior root.

BLOOD SUPPLY OF THE SPINAL CORD.—The principal arteries of the spinal cord are either direct offsets from the vertebral (anterior spinal) or indirect branches from the same artery (posterior spinal)—the latter arising from the inferior cerebellar, which are twigs from the termination of the basilar artery. Apart from these vessels, the blood-supply of the cord comes from still smaller twigs, derived from the intercostal and lumbar arteries, which anastomose with and reinforce the anterior and posterior vessels at intervals, along the whole length of the cord.

A peculiarly tortuous network of veins surrounds the spinal cord on all sides, and there is a natural slowness of the blood-current which is aided by many causes, bearing upon cardiac and respiratory action, as violent emotions or efforts, or distinct diseases of the respiratory or cardiac systems.

From the anatomy of the spinal cord thus described the question may be asked, how these channels act in conducting impressions to or from the brain?

The answer to this is, broadly speaking, **ANTERIOR MOTOR, POSTERIOR SENSORY**,—anatomical facts easily remembered by the statement that the letter "s" occurs in the word *posterior* but not in *anterior*.

Impressions of touch, temperature, pressure, and tickling are conveyed to the brain by the posterior columns.

The path of impression from muscles to the cerebrum is also found in the posterior columns, so also are carried to the brain the impressions from the "genital centres" in the lumbar region.

It is said that, although impressions from the sexual

organs, the perinæum, and anal regions are carried up by the posterior columns, yet other impressions from the lower extremities are conveyed by the lateral instead of the posterior columns.

The outgoing channels of conduction from the brain to muscles below the decussation of the pyramids are found chiefly in the posterior part of the lateral column. The fibres descend through these columns to different levels, according as these stimuli are destined to evoke the activity of different nerves and muscles.

Thus, to excite movements in arms or legs, motor fibres penetrate the grey matter (anterior horns) of the cervical enlargement in the former case, of the lumbar swelling in the latter. They now come into relation with some of the great nerve-cells contained therein, whence outgoing fibres arise and constitute the fibres of the anterior roots.

We can now understand what are termed "SPINAL REFLEXES." These are divided into (*a*) the superficial or skin reflexes ; (*b*) the deep so-called "tendon reflexes."

Dr. Gower's tables well illustrate the skin reflexes, and they are now given in his words :—

Name of Reflex.	Mode of Excitation.	Nature of Result.	Level of Cord on which Reflex depends.
PLANTAR REFLEX .	Tickling sole of foot.	Movements of toes ; of these and foot ; or of these and leg.	1st, 2d, and 3d sacral nerves (lower part of lumbar enlargement).
GLUTEAL REFLEX .	Irritation of skin of buttock.	Contraction of glutei.	4th and 5th lumbar nerves.
CREMASTERIC REFLEX .	Irritation of skin of upper and inner part of thigh.	Drawing up of testicle.	1st and 2d lumbar nerves.
ABDOMINAL REFLEX .	Irritation of skin of abdomen along edge of ribs, and above Poupart's ligament.	Contraction of upper or of lower part of abdominal muscles.	8th to 12th dorsal nerves.
EPIGASTRIC REFLEX .	Stroking side of chest over 6th and 5th intercostal spaces.	A dimpling of corresponding side of epigastric region (contraction of highest fibres of rectus abdominis).	4th to 6th or 7th dorsal nerves.
SCAPULAR REFLEX .	Irritation of skin in interscapular region.	Contraction of posterior axillary fold (teres), or of several of scapular muscles.	6th or 7th cervical to 2d or 3d dorsal nerves.

B. TENDON REFLEXES.—These are two in number, “ankle clonus” and “patellar tendon reflex” (“knee reflex,” or “knee jerk”).

If a smart tap is made at the lower part of the patella in health, when the leg lies loosely over the side of the bed, the leg and foot are involuntarily raised. In some diseases, notably locomotor ataxy, the tap over the same region elicits no response, the leg and foot being quiescent; and hence there is a broad inference that disease is present, that the link of communication does not exist in its entirety.

Absence or presence of “patellar tendon reflex” is an important feature in diagnosis of nervous diseases involving the spinal cord.

“Ankle clonus” is not a feature of health, and its presence betokens disease.

A tabular statement of these two reflexes is thus given:—

Name of Reflex.	Mode of Excitation.	Nature of Result.	Level of Cord on which Reflex depends.
"KNEE JERK," or PATELLAR TENDON REFLEX	By striking patellar tendon with edge of hand, or with percussion hammer, while leg hangs loosely over fellow, or over fore-arm of operator; also by striking quadriceps tendon above patella.	A single upward jerk of leg or foot, slight or distinct.	2d and 3d lumbar nerves.
ANKLE CLONUS . . .	With knee extended or very slightly flexed, by pressing firmly and quickly against anterior part of sole of foot (so as to stretch calf-muscles), and then keeping up the pressure.	A series of clonic contractions in the ankle-joint, continuing as long as the pressure is maintained, and instantly ceasing when it is relaxed. If the condition is very highly marked it may spread to the whole limb, or even to that of the opposite side.	1st to 3d sacral nerves (lower part of lumbar enlargement).

Brown-Séguard first described, in 1858, ankle-clonus, and it was more particularly defined by Charcot and Vulpian in 1866.

In 1874, Westphal and Erb almost simultaneously described tendon reflex as it existed in health, and drew attention to the significance of its absence in the diagnosis of locomotor ataxy, in which the posterior columns of the spinal cord are diseased.

DISTURBANCES OF NUTRITION.—By disturbances of nutrition are understood alterations in the trophic relations between different tissues and different parts of the spinal cord. We shall consider these disturbances of nutrition in detail, and commence with those acting

ON THE SKIN.—Irritation of the posterior cornua or of the posterior roots of the spinal nerves may give rise to various pustular and vesicular eruptions in related portions of the skin, and the inflammation is often associated with neuralgic pains in the same region. A striking instance is herpes zoster or shingles, which usually follows on neuralgic pains in the line of the distribution of the intercostal nerves.

In other cases, with lesions in some parts of the grey matter, more grave nutritive disturbances may ensue. Thus, acute sacral bed-sore in acute central inflammation of the cord (myelitis) may ensue, or the same issue may follow certain cases of cerebral hæmorrhage.

The author's recollection of this grave disturbance in myelitis is vivid and painful. A surgical case some years ago was hurried, without any consultation, into his medical ward after an operation. The patient was completely paralysed, and, notwithstanding all care and attention from experienced nurses, acute sacral bed-sores developed. At her own request and the desire of her friends she was, after a short residence in the ward, taken home, and died in about a fortnight. An ill-advised prosecution was instituted by the local authority, and vile insinuations of inhuman conduct and professional ignorance and carelessness were inserted into a daily

paper. The inquiry was carried on in secret for six months, and was only terminated by the decision of the crown counsel for Scotland.

ON MUSCLES.—Degeneration or destruction in any way of the great ganglion-cells of the anterior cornua or of the anterior roots of the spinal nerves, may give rise in two or three weeks to atrophy of the muscle-fibres with which such cells or nerve-roots are in relation. We thus have “atrophic paralysis” associated with the electrical “reaction of degeneration.” Thus, the deltoid muscle may waste after dislocation of the shoulder and stretching and injury of the circumflex nerve; or, when there is disease of the anterior cornua of the cord, progressive muscular atrophy and infantile paralysis may follow.

DISEASES OF JOINTS.—Certain diseases affecting the grey matter of the cord are also apt to be associated with chronic diseases of joints. These diseases affect ill-defined sites in the cord, and they are sometimes comparatively unimportant. At other times they may lead, as in some advanced cases of locomotor ataxy, to great atrophy of the articular ends of the bones, and possibly to dislocation and utter destruction of joints. Atrophy and brittleness of bones may also be met with.

PERIPHERAL NERVES.—If a nerve is injured or badly lacerated, changes follow in the afferent and efferent fibres on the distal side of the injury. The medullary substance coagulates and breaks up into drops, and is finally absorbed; the axis cylinders are also destroyed, and the nuclei of the neurilemma proliferate and harden into connective tissue—a condition of matters termed **SCLEROSIS**.

SECONDARY NERVOUS DEGENERATION.—This is alluded to more particularly under sclerosis, and means a state of hardness, induration, or toughness of the connective tissue (neuroglia) of the brain or spinal cord. Thus, if the motor tract be interrupted by disease or injury at

any part, descending degeneration ensues ; or, if the sensory tract be involved, ascending degeneration follows from the seat of interruption.

DISTURBANCES OF SENSATION.—Anæsthesia, or want of feeling, and hyperæsthesia, or excess of feeling, are applied respectively to conditions of defective or exaggerated sensibility. These terms may apply to—

(a) Nerves of special sensibility, as the olfactory, optic, auditory, and gustatory ; or to—

(b) The remaining sensory nerves, the perceptions of which are known as “common sensation.” In hyperæsthesia, there is a heightened irritability of the nerve-centres, so that the slightest noise may irritate, the gentlest touch may cause pain, while bright light cannot be borne without great suffering. This condition is seen in inflammatory affections of the brain and in hysteria.

In anæsthesia the opposite conditions exist, and it is attended with numbness or prickling sensations. These denote impairment or loss of sensibility, which may either be superficial or deep-seated. The sensibility may be impaired, while the muscular sense and the power to distinguish between variations of temperature may remain normal. This state of anæsthesia is seen in hysteria and various organic nervous affections.

DYSÆSTHESIA (δύς, with difficulty ; αἰσθάνομαι, I feel) may be applied to impairment of any of the senses, but it especially refers to that of touch, and includes tingling and numbness, burning, shooting pains in the ears, and flashes of light in the eyes.

GENERAL ANÆSTHESIA accompanies only general paralysis of the insane.

HEMIANÆSTHESIA consists in loss of sensation in one half of the body. It is sometimes associated with motor paralysis, and is then dependent on brain disease (posterior third of internal capsule).

“**HEMIPLEGIA**” may be developed with a hysterical condition, in which case there is no real loss of motor power,

or it may be the result of brain disease. If dependent on a hysterical condition, Charcot thinks it is always associated with tenderness of one ovary.

CONVULSIONS.—The term “convulsions” is applied to series of more or less purposeless muscular contractions, occurring simultaneously or successively for a certain length of time. Certain localised purposeless contractions of a muscular character may be termed “spasms”; and like convulsions these are of two kinds, “tonic” and “clonic.” Convulsions or spasms of the “tonic” type imply continuous muscular contraction without any intermission. In the “clonic” variety a different state of matters exists, the spasmodic movements being of short duration and attended with a series of intermissions. Tetanus represents the “tonic convulsions”; chorea, the “clonic.”

Convulsions are termed **PRIMARY** or **ESSENTIAL** when they occur without any known cause or are the result either of some local irritation or mental or moral agitation. They are called **SYMPTOMATIC** when they occur as a result of injury or structural disease of the nervous system, and **SYMPATHETIC** when they are the prelude to grave constitutional disturbance, as in some specific fevers, or the consequence of acute renal or pulmonary affections, or connected with non-nervous structural disease. As examples of the first class of convulsions may be instanced those associated with epilepsy; as examples of the second may be cited those which sometimes usher in small-pox or attend Bright's disease or acute pneumonia.

These convulsions alluded to may as a class be termed **EXTERNAL**, to distinguish them from a scarcely definable group called **INTERNAL** convulsions. Laryngismus stridulus (false croup) and recurrent hiccup, are typical examples of internal convulsions.

Convulsions, either clonic or tonic, form the leading features of four diseases—epilepsy, tetanus, chorea, and hydrophobia. Eclampsia and convulsions are convertible terms.

TREMOR.—Tremor (trembling) is a slight form of clonic

spasm, consisting of movements successive in character but of limited range. Tremors are designated "coarse" or "fine," and are seen chiefly in the hands, head, or facial muscles. They may be the result of old age, as in paralysis agitans; or they may be associated with certain poisons, as of lead, mercury, or alcohol; or due to masturbation, or great muscular exercise.

CHOREA.—Choreic movements literally mean dancing (*χορεία*, a dance). They are characterised by a succession of involuntary movements, "clonic" in their nature, occurring in almost all parts of the body, and, like "tremors," ceasing during sleep. Chorea is considered as a distinct disease, and may involve either the whole body or the half, or be confined to a single limb.

In concluding these remarks on convulsions it may be stated, that different exciting causes come into play at various periods of life, and a brief summary of these will now be given. Thus, convulsions in infancy, from birth to the second year, are sometimes hereditary, sometimes the precursors of an acute disease; more frequently they are associated with such peripheral irritations as teething, overloaded stomach with acidity, and indigestible food.

From the second to the thirteenth year convulsions may be due to the two latter causes mentioned, and these may be supplemented by another potent cause, viz. fright. Occasionally they occur from worms.

From the thirteenth to the twentieth year epilepsy may come on from ovarian irritation or masturbation; or it may arise from such factors as excessive study, worry, or mental anxiety; or from unknown causes.

From the twentieth to the fortieth year fits originate less frequently, yet they may be developed from syphilitic nodes, pregnancy, minute hæmorrhages in the brain, uræmia, intemperance, or venereal excesses.

After forty, various causes may determine convulsions. It is the climacteric age of women and, to a certain extent, of men; and various organic diseases of the brain may develop at such a critical period.

Lastly, convulsions may come on at any age from the action of narcotico-irritant poisons ; or from eating mussels, shellfish, or poisonous mushrooms.

GENERAL THERAPEUTICS OF THE NERVOUS SYSTEM.

Previous to discussing electricity more fully, I will make a few remarks upon the general therapeutics of the nervous system. There is no doubt that great difference of opinion exists as to treatment in nervous diseases, yet there are some broad remedial measures which time and experience have established as the best.

Means which increase the blood supply.—(1) Posture. The patient is placed on his back, his feet and limbs are raised, his head kept low, and the result is more blood is sent to the brain. (2) Compression of arteries is sometimes, though rarely, resorted to, as tourniquets to the femoral and compression to the carotid arteries. (3) Stimulants. Alcohol, ammonia, food. (4) Paralysing the vaso-motor nerves. Special benefit is derived from inhaling nitrite of amyl.

Means which decrease the blood supply.—(1) Venesection. Now rarely used, yet, without doubt, an admirable and safe remedy in plethoric cases. Leeches and cupping counter-irritate and diminish the blood-supply. (2) Position. Placing the patient on his face decreases the circulation in the spinal cord. In extreme cases of insomnia, sleep may be obtained in the sitting posture. (3) Continuous cold. The application to the spine of pounded ice in a bladder is useful in cerebral meningitis and spinal inflammation. (4) Galvanism stimulates the vaso-motor nerves and produces anæmia ; so also do ergot and belladonna. (5) Mental rest, light literature, pleasant conversation, and sweet music, are important addenda to general treatment in diminishing the cerebro-spinal blood supply.

Cerebral Excitants.—Alcohol, cannabis indica, opium in small doses, and belladonna.

Spinal Excitants.—Nux vomica or strychnia, and

Easton's syrup, when there is not inflammation but nervous exhaustion, as in some cases of epilepsy and spinal irritation. Quinine is, to a certain extent, a cerebral excitant; and cantharides stimulates the lower part of the spinal cord in inertia of the bladder or genital organs.

Cerebral Depressants.—Cold and bromide of potassium occupy the chief place, the bromide being very valuable in sleeplessness and all forms of cerebral excitement. It is supposed to act by depressing the cerebral circulation and producing temporary anæmia of the brain. Hydrate of chloral cautiously given up to gr. xxx. either alone or with bromide, is valuable in insanity. Opium, or the salts of morphia, either internally, by suppositories, or hypodermically, are useful, unless there is an idiosyncrasy contra-indicating their employment, as in the case of some females.

Spinal Depressants.—Succus conii, ʒss. to ʒi. daily, is the most valuable preparation. Bromide of potassium and chloral also are of great service in various diseases; and, in poisoning by strychnia, chloral is an undoubted specific.

Tonics and Restoratives.—Preparations of phosphorus and zinc occupy the foremost place as tonics and restoratives in nervous diseases. Next come fatty food and strychnia, arsenic, iron, quinine, and sea-bathing; while cold baths are useful if the reaction of the skin is good and no chill follows their employment.

Arsenic is specially serviceable in chorea. Quinine acts to some extent directly on the nervous centres; iron, indirectly, by raising the general tone and nutrition of the system. Constitutional syphilis with nervous phenomena is best treated by iodide of potassium with small doses of perchloride of mercury. Malarial neuralgia is checked by the hypodermic injection of quinine over the affected nerve (F. 11d).

Counter-Irritants.—Blisters, dry cupping, sulphur baths, and, within certain limits, faradic and galvanic electricity, are the means chiefly adopted as counter-

irritants. The actual cautery and setons have fallen into disuse.

Hygienic means of relieving irritation are such physical exercises as walking, rowing, and horse-riding, sea-voyages, and change of climate.

ELECTRICITY.

Since the discovery by Galvani of the physical effect of an electrical current on the muscular system, electricity as a curative agent has been more and more recognised, until now no physician's armamentarium is complete without the means of applying it. A knowledge of the principles on which it is based, and its application especially to nervous diseases, therefore form a fitting introduction to the consideration of the individual diseases ranked as nervous.

Electricity manifests itself in two forms, known as "static" and "dynamic." Static electricity, which is that form exhibited in the discharge of lightning, may be produced on a small scale by exciting glass or ebonite by rubbing it with various substances, such as silk, flannel, etc. Although at one time used for medical purposes, it is now wholly discarded, or at least but rarely employed. Dynamic electricity, on the contrary, is now often used, and is produced, for curative purposes, by means of *a*, batteries, *b*, batteries and induction coils. In the first of these forms the electricity is generally termed the galvanic, continuous, or constant current; that from the second, the faradic, or interrupted current. The production of a galvanic current is dependent on the chemical action which takes place between two plates of different metals. If two plates—one of copper, the other of zinc—are immersed in acidulated water, no action will be observed; but, if a metallic connection be made with the parts which are out of the liquid, as with a wire, bubbles of gas (hydrogen) will be seen to collect on the part of the copper plate immersed, and the wire can be shown by suitable tests to have an ELECTRICAL CURRENT flowing

through it. Such a combination is termed a **GALVANIC CELL**, and a number of these would form a **BATTERY**. The two plates are the **ELEMENTS**, and the parts to which the wires are attached are the **POLES** of the battery. The zinc is termed the **POSITIVE ELEMENT** but **NEGATIVE POLE**, the copper the **NEGATIVE ELEMENT** and **POSITIVE POLE**. THE CURRENT FLOWS ALWAYS FROM THE POSITIVE TO THE NEGATIVE, THAT IS, FROM THE ZINC TO THE COPPER WITHIN THE LIQUID, AND FROM THE COPPER TO THE ZINC WITHOUT. The conditions noted are represented in the woodcut.

The essentials of a battery suited for the medical application of electricity are, that it shall be moderately strong, easily kept in order, and that it shall be as **CONSTANT** as possible, that is to say, that any decrease of power—which is unavoidable in all batteries—shall be as slow and as regular as possible.

The batteries best fulfilling these conditions, and most generally used, are those composed of Leclanché, Bichromate, or Smee's cells. The first two are those most employed in practice. They are used in batteries of from ten cells upwards.

In the making up of batteries for medical use, there are various fittings necessary to facilitate the application of the current to a patient. The battery for this purpose should have the means of including in the circuit any

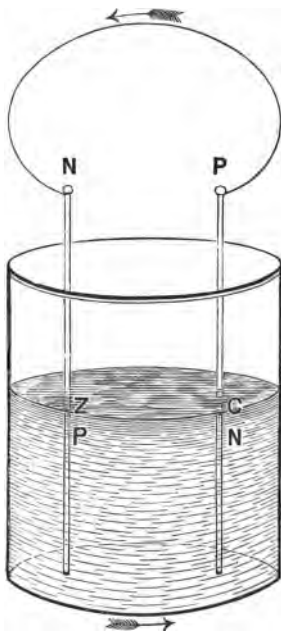


Fig. 18.

number of cells at will, so that thereby the power of the current may be regulated. This is effected by a *switch*.

It should also have the means of opening and closing the circuit when required. The instrument used for this purpose is termed a *key* or *interrupter*.

It must also have the means of reversing the direction of the current during its application without altering the position of the rheophores placed on the patient's body. This is effected by means of a *commutator*.

The galvanic current has well-marked thermal effects. Such effects are produced when great resistance is offered to the passage of the current, as, for instance, if a short piece of very thin wire be introduced as part of the circuit, the work done by the current will be expended to a great extent in heat; and, if the current be strong enough, the wire will be raised to red-heat, and possibly fused. This peculiarity is taken advantage of in the galvanocautery, in which a platinum wire or knife is made red-hot by means of a suitable battery, and in this condition is used for the excision of tumours.

In application this thermal action is most evident at the negative pole, which, with a moderately intense current, will produce a redness of the skin that ends in inflammation and sloughing. The practical point deduced from this fact is, to avoid the long continuance of the applied point to any part of the body. **CHANGE OF THE NEGATIVE RHEOPHORE IS THEREFORE NECESSARY WITH THE CONTINUOUS CURRENT.**

The galvanic current is capable of producing what are termed "electrolytic effects." What is meant by this is, if a galvanic current is directed into a fluid containing different elements, decomposition ensues. Thus, if a galvanic current is passed through water, that fluid will be resolved into its constituent elements, oxygen and hydrogen, and these gases will be seen rising in bubbles to the surface.

The electrolytic action of the galvanic current, thus explained, must have the same effect on the human body, which consists of a mass of cells bathed in saline fluids.

This great fact is the key-note to the advantage of the galvanic current directed against disease, and elucidates many of the phenomena observed when galvanic currents are passed through the body.

Faraday termed the positive pole the **ANODE**, and the negative pole the **CATHODE**. These terms are frequently used in speaking of electricity by this method.

We will now consider the faradic or interrupted current. The interrupted current is produced by means of a single galvanic cell and a medical induction coil. As the former has already been described, the latter will now be explained.

It has been found that, when a wire carrying what is termed the "primary" current of a galvanic cell is brought near another wire, a "secondary" current is set up in this other wire in a direction opposite to that of the primary current, although there is no contact between the two wires.

A medical coil consists of a primary and a secondary coil. The primary coil consists of comparatively few spirals of thick copper wire covered with cotton as insulating material, and having binding screws at each end to form a convenient connection with the galvanic cell. The secondary coil consists of a great many layers or spirals of very fine copper wire having an insulating covering of silk, and is wound round the primary coil, but has no metallic contact with it, the secondary current being "induced" in it simply by its proximity to the primary current.

The **INTERRUPTER** is a beautiful arrangement for the automatic make-and-break of the current.

Certain symbols may here be explained. If one rheophore be placed on an indifferent part of the body and the other placed over a nerve-trunk or muscle, we are able, by means of the commutator and key, to study the action of either pole on nerves and muscles during the making and breaking of the current. With weak currents, it is found that contraction only occurs when the stimulating rheophore is negative (cathode) and only on closing

the circuit. This is called technically "cathodal closure contraction," and is expressed for brevity by C.C.C. If the strength of the current be slightly increased, we get contraction also when the stimulating rheophore is positive (anode) and the circuit is opened, as expressed by A.O.C. Next follows anodal closure contraction (A.C.C.); but cathodal opening contractions (C.O.C.) never occur in healthy muscles with any current short of those of unbearable intensity.

Having mentioned the principles on which the two forms of electricity are based, we may now ask, What are their essential and distinctive differences? The answer is, that the *induced* current is momentary not continuous in its action; its direction is constantly changing; it has neither chemical, thermal, nor electrolytic effects; it has greater tension than the constant current, and more easily overcomes muscular resistance; it also causes far more readily the contraction of healthy muscle; and finally, it does not affect the nerves of special sense, as the *constant* current does. For if the latter be applied in the neighbourhood of the eyes flashes occur, and too strong an application may produce blindness. The gustatory nerve is also affected when the rheophores are placed on the cheek, taste being generated, acid with the positive, but metallic or coppery with the negative pole. When the rheophores are held to the ear, rumbling sounds ensue, and stimulation of the olfactory nerve excites a peculiar odour.

The great cardinal distinction between the two currents, in addition to what has been stated, is this, that the principal action of the continuous current takes place not at the time of "MAKING" or "BREAKING," but during the SILENT PERIOD.

Applying the facts mentioned to therapeutics, we may say that the rapid interruptions of the induced current, if moderately strong, exhaust completely the irritability of a muscle and induce fatigue. The galvanic current, on the contrary, by its silent non-interrupted power, has a singularly refreshing effect. So much is this

the case, that Dr. Poore finds that actual strength is given to the muscle by the continuous current, and that a man can, by its influence, sustain a weight at arm's length longer than he could if the current were not applied.

The feeling of weariness and fatigue in muscle is also dispelled by the continuous current.

How are electric currents applied? The answer is, By conducting-wires from the battery, and these terminate in rheophores of different shapes, suited to the parts of the body to which they are applied. Insulated copper wires form the best conductors, and the rheophores should have insulating handles. The junction between the conductor and the rheophore should be about the middle of its length, so that both conductors may be held in one hand without the risk of the metallic junctions coming in contact.

The sponge-holder is the most useful rheophore. The metallic rheophores vary in size from half-a-crown to the pointed extremity of an olive-shaped conductor; they should be covered with wash leather, and used moist. If it is desired only to influence the skin, the rheophore must be used dry; but, if deeper tissues are to be affected, the resistance of the epidermis must be overcome by thoroughly moistening it with hot salt water. One rheophore may be used dry and one moist, or a porcelain or gutta-percha vessel containing water may be used as a rheophore and the limb placed in it.

The two methods of applying electricity are known as GENERAL ELECTRIZATION and LOCALISED ELECTRIZATION.

By general electrization the current is passed through the whole body. The efficacy of electricity so used is doubtful.

Localised electrization, initiated by Duchenne, seeks to influence special nerves, muscles, or organs, and its action is limited to these parts. Duchenne's method is termed "DIRECT;" and the rheophores, held both in one hand, may be played over the surface of the muscle.

The "indirect method," recommended by Ziemssen, influences the nerve supplying the muscle, and one rheophore is then applied to any part of the body, while the other, in the form of a small pointed body, is made to

touch the nerve supplying the muscle at the point where it is most superficial.

Both of these methods may be tried in individual cases, as it is inadvisable to adhere exclusively to one.

In cases of paralysis which are on the road to recovery, it is desirable to combine electricity with exercise of the affected muscles.

What are the diagnostic uses of electricity?

The answer to this is, We may by electricity distinguish between paralysis due to a CENTRAL or a PERIPHERAL lesion.

What is the meaning of these terms central and peripheral?

A paralysis is "central" so long as that portion of the nerve-centres with which the paralysed nerve is in communication remains healthy, the lesion being higher up in the cerebro-spinal axis. Thus, injury to one corpus striatum, causing one-sided paralysis, is "central," the cord and the greater part of the brain remaining sound. Cases, too, of paraplegia from local injury, the cord below being healthy, although all control by the mind is lost, we still understand to be examples of central paralysis.

Electricity, as a diagnostic agent, enables us to discover such conditions by the three following tests—

1. Reflex stimulation of the muscles is possible.
2. The muscles undergo little wasting.
3. The irritability of the muscles to faradism is little altered, in fact hardly diminished.

But if, on the contrary, we find the muscles cut off from communication with their nerve-centres, or communicate *directly* with centres which have been sapped by disease, then we understand that peripheral, not central, paralysis exists.

This condition of matters is detected by two leading signs.

THE MUSCLES WASTE VERY RAPIDLY, AND THEIR IRRITABILITY TO FARADISM IS GREATLY DIMINISHED, IF NOT DESTROYED.

In paralysis, diminished irritability is discovered and estimated by comparison with the sound side. To effect

this, one of the rheophores is applied (in the form of a big sponge) to the middle of the body, the limbs are arranged exactly symmetrically, and the muscles are tested by the application of the other rheophore, which has a pointed end, to corresponding parts of healthy and unsound limbs. If no contraction follows when we apply to the diseased muscle the current of least intensity that makes the healthy one act, then we know that paralysis exists; and the amount of this may be determined by increasing the current and observing at what strength irritability is apparent, or whether it is completely destroyed.

Diminution and loss of irritability are not immediate consequences of the paralytic lesion. They are not observed until a WEEK or TEN DAYS have elapsed. In cases of paralysis affecting both sides we cannot have a comparative estimate; but it is found that, after total extinction of faradic irritability, the muscles may still respond to a slightly interrupted galvanic current, and that, in fact, occasionally the irritability to galvanism so applied is greater on the paralysed than on the sound side of the body. German writers, who have carefully investigated this subject, state that not merely quantitative, but qualitative, changes take place in the irritability of muscles to the induced current. This is represented by saying that "the anodal closure contraction" (A.C.C.) soon becomes very apparent, and equals or even surpasses "the cathodal closure contraction" (C.C.C.), and further that the "cathodal opening contraction" soon becomes more marked than the "anodal opening contraction."

These changes in the action of the muscles appear to depend on degeneration, and are spoken of as THE REACTION OF DEGENERATION. These quantitative and qualitative changes are found in some forms of paralysis due to degenerative changes in the cord; in so-called spinal paralysis both of infant and adult; in traumatic paralysis due to injury of a nerve trunk; in rheumatic paralysis due to thickening of the neurilemma; and in lead-paralysis.

We now come to ask the important question, To what

use can electricity be applied in the treatment of disease? Avoiding exaggerated statements on this subject, easily made and difficult to disprove, we may justly state that attempts to remove the cause of the paralysis by influencing the nutrition of the parts where such cause is situated are worthy of trial, and they should consist in acting on the sympathetic nerve-fibres supplying the blood-vessels of the part.

Thus a clot in the brain, caused by cerebral hæmorrhage, and evidenced by an apoplectic seizure, may be hastened in its absorption by stimulating the nutrition of the damaged brain-substance through the cervical sympathetic nerve. This influence is accomplished by placing one rheophore over the superior cervical ganglion (which may be reached by pressing inwards at the angle of the jaw), and the other on the back of the neck over the first and second cervical vertebræ.

It is to be carefully noted that such electric treatment should not be attempted until all danger of irritation is gone, certainly not before three weeks from the original paralytic seizure.

The application of the electric current to paralytic muscles is of service, and is based upon the reasonable supposition that we wish to keep the paralysed muscles in a fairly healthy, well-nourished condition, so that if the central lesion ever becomes the seat of activity and health, the brain will have no trouble in evincing its power. The treatment itself must be by that current to which the muscles most readily respond. If the induced, then the induced current; if the continuous, then the continuous or constant current. Always employ the weakest current possible, so as to refresh, not fatigue, the muscles. Repeat the application every other night and operate systematically on each muscle implicated.

In certain conditions, on the other hand, of paralysis, electricity can be of no use. What are these conditions? If the paralysis to the will remain absolute, and if the contractility of the muscles be perfect, we do no good by electric treatment. This condition is often seen in hemiplegia.

If the irritability to both forms of current has completely disappeared, it ill behoves us to hold out imaginary hopes of recovery to the patient. Such conduct is unprofessional and unjust.

Yet, even if paralysis to the will remain absolute, and if the irritability of the muscle be diminished, electricity will be serviceable, as by its employment the tone and nutrition of the muscles are improved, so far as irritability is concerned. When this stage of improvement is reached, electricity may be discontinued.

Electricity is also useful in painful affections. The galvanic current is found best for these, and the positive pole, according to some authorities, ought to be placed on the painful spot. Thus neuralgia of any type may be relieved, especially neuralgic headaches; so also may lumbago, sciatica, and other painful rheumatic conditions be alleviated, if not absolutely cured.

Electricity is also employed, and successfully, in spasmodic diseases. Tremor and writer's cramp may be relieved by it. Tonic spasm of internal organs, such as the bowels and bladder, may yield to the galvanic current. In other diseases, when the nervous origin is not so apparent, well-directed electricity may do good. Thus, the pain of angina pectoris and herpes zoster may be assuaged. Even skin diseases of an obstinate character may be benefited. In rheumatic gout it may be beneficial—one pole being applied to the epigastrium, the other to the diseased member.

Some authorities state that excessive urine in diabetes has been lessened by its use; ovarian tenderness and amenorrhœa have disappeared under its influence.

The last application of electricity in therapeutics may now be alluded to, viz. the galvano-cautery and galvano-puncture. Cauteries may be heated by electricity, and, when so heated, they may be used to destroy diseased masses, or to disperse tumours; while the absorption of hydatid cysts of the liver has been hastened by the galvano-puncture.

The galvano-puncture is now a recognised method of

treating aortic aneurysm, and the operation seems to be without danger or pain. The application is easy. The current should be generated by small cells of low electromotive power (Smee's cells modified by Foveaux seem the best). Each pole should terminate in a firm needle carefully insulated except at the point. Both needles should be thrust quickly and boldly into the sac, care being taken that they are separated in the sac by an inch of space or more.

The effect of the current is to cause a firm coagulum round the positive pole, while the liberation of gas at the negative pole causes there a soft frothy coagulum. A current of ten to twelve cells can be borne for an hour or more. When the needles are carefully withdrawn, the orifices left in the skin must be closed by collodion.

The operation may be repeated at a suitable interval, and consolidation of the aneurysmal sac is sometimes the fortunate result. Twice in my hospital experience this was observed.

This section is divided into three sub-sections. The first contains the names of morbid states and processes affecting the several parts of the nervous system; the second, the names of symptoms and groups of symptoms connected with such pathological conditions, or with other conditions not accurately known; the third, the names of mental diseases.

SUB-SECTION 1.

CEREBRAL CONGESTION

may be either active or passive, and certain appearances, which may, however, be all or in part absent, are observed on post-mortem examination. In the active form, the capillaries and large blood-vessels of the brain and pia mater are increased in size; hence the blood-points are observed to be larger and more numerous than usual, while the pia mater has a red or rose-coloured appearance either in spots, or throughout its whole extent. The grey matter

is red or violet in hue, the choroid plexuses are enlarged, and the ventricles contain an excessive amount of fluid. In the passive form, when the quantity of venous blood is augmented, the veins generally are distended.

Symptoms.—In the active form, there are pain, dizziness, and confusion of the intellect, which may last from half-an-hour to two or three days; sleeplessness, irritability of temper, and inability to do any mental work, with a sense of flying heat shooting over the head and neck, and redness of the face, are also prominent symptoms. In the passive form, there is the same confusion of ideas, but with mental torpor instead of irritability, and drowsiness instead of sleeplessness. In the very severe forms, there may be loss of consciousness, delirium, or convulsions. The slight forms are rarely dangerous in themselves, and may be recovered from under treatment. In the severe forms, the prognosis is grave, and, when death occurs, it is due to coma. Cerebral hyperæmia or congestion is now a common condition, in a more or less pronounced form, in mercantile and professional life.

Treatment.—Its premonitory symptoms demand mental rest, with abstinence from work; and this rest may be aided by the liquid extract of ergot (x to xxx m. thrice daily), or bromide of potassium, by sleeping with the head high, and avoidance of alcoholic stimulants in every form. Exposure to the sun and variations of temperature is also to be shunned. Dinner should consist of fish; white meat, as poultry, mutton, or veal; and milk- or rice-puddings. Highly-spiced dishes are countermanded—the plainer the fare, the better the digestion. For constipation, tincture of jalap, syrup of ginger, and decoct. aloes co. (F. 25) or tamar indien are specially recommended.

If the pulse is feeble, stimulants in small quantities may be required. Medicinally, to increase cardiac tone, give tincture of digitalis in small doses (iv. to v. m. thrice daily); or "Warburg's tincture," a special preparation of quinine, in teaspoonful doses before breakfast.

For the first four or five months a quiet life is absolutely necessary with cessation from work, but afterwards, to

bring about complete convalescence, change of scene is valuable. High altitudes should be avoided.

CEREBRAL HÆMORRHAGE.

Cerebral Hæmorrhage, by which is meant extravasation of blood in the substance of the brain, depends essentially, according to recent authorities, on MILIARY ANEURYSMS, which appear as little globular masses in the small intracranial vessels, and are due to a diffuse arteritis proceeding from without inwards. Although this statement may in the main be true, yet hæmorrhage may also arise from softening of the cerebral tissue, from atrophy of the brain-substance, and from tension of the blood-vessels, the result of mental and physical causes. In the majority of cases, the seat of cerebral hæmorrhage is the corpus striatum, the optic thalamus, the crus cerebri, or the medulla oblongata, on the right side more frequently than on the left. The blood poured forth, varying in quantity according to the causes, dislodges part of the brain substance and lies in the cavity thus produced. "A smash into the ventricles" is a colloquial post-mortem observation when the extravasation is great. If death does not occur, the further behaviour of the extravasated blood is, the absorption of the serum, the contraction of the fibrin and degeneration of the red corpuscles, the closing of the cavity, and eventually the formation of a cicatrix which contains the remains of the clot.

Symptoms.—Often, previous to the attack, a group of symptoms may forewarn the patient, as sudden difficulty of speech, defects of vision, dizziness, faintness and sickness. There may, however, be none of these prodromata, the patient being struck down abruptly as if shot, and rendered thoroughly unconscious with loss of sensibility and motion. In such a case we find the breathing is stertorous, the lips and cheeks are puffed out with expiration, and the pupils are largely dilated and insensible to light. After a time, if death does not occur, consciousness returns, the patient attempts to turn in bed, and endeavours to speak.

He finds, however, that articulation is indistinct, that the muscles of one side of the face are paralysed, and that the power of motion of the limbs and body on the opposite side is lost.

The temperature is found at first to be low, 96·8° F., afterwards normal, 98·5° F., so continuing if recovery is to be complete ; but, if a fatal result is to ensue, it will rise markedly to 104° F. or 106° F.

There is another form of cerebral hæmorrhage without unconsciousness, in which the patient is sensible of his condition, but unable to avert the hemiplegia which ensues.

Causes.—A long list of exciting causes may be made out. It will suffice simply to mention drunkenness, excessive venery in old people, extreme joy or anger, and straining at stool. It is also found that winter is more favourable to the occurrence of cerebral hæmorrhage than summer, and that neither a thin nor plethoric frame, neither poverty nor riches, specially provoke it. The chief predisposing causes are diseases of the heart and vessels, and occupations necessitating great exertion.

Prognosis.—In the severe seizures, death may occur within a few hours ; in the less severe, about one-third of those attacked die ; while, in the mild form, the prognosis is generally favourable, although the patient cannot be considered free from danger until after the eighth day.

Treatment.—If there are any forewarnings, the bowels should be opened by a brisk purgative, the head kept cool and well raised, every mental strain avoided, and the bromide of potassium given in thirty-grain doses.

During the attack, symptoms should be met as they arise. If the bowels have not been recently opened, place two drops of croton oil on the tongue ; if the urine is not passed naturally, draw it off with a catheter ; if hæmorrhage is still supposed to be going on, give a hypodermic injection of ergotine. The patient should also be kept quiet with the head well raised, and in a well-ventilated room of an even temperature.

A great general rule may be stated, viz.—not to give

stimulants or apply electricity until the clot on the brain is considered absorbed and a cicatrix formed. Hence, not until the 14th day should remedial measures be put in force to restore the power of motion and prevent contracture. The agents best suited for this purpose are passive motion, strychnia, phosphorus, and electricity (F. 58).

CEREBRAL ANÆMIA.

In cases of death from cerebral anæmia, a pale colour of the brain is observed, most marked in the grey substance, but also making the white matter look more pale than normal. There is also an absence of the usual red points, combined with a diminished quantity of blood in the vessels.

Symptoms.—Giddiness, ringing and buzzing in the ears, paleness of the face, faintness and loss of consciousness, characterise the lighter forms of cerebral anæmia, as in the faintness which attacks the student on his first sight of an operation. The graver forms may be due to sudden hæmorrhage, and may be attended with convulsions and coma. The state of the pupils is first one of contraction, next of dilatation, and, finally, they return to the normal condition if the issue is to be favourable. By many authorities, death from sudden shock is ascribed to cerebral anæmia.

CEREBRAL EMBOLISM AND THROMBOSIS.

If the occlusion, the shutting up of a vessel in the cerebral circulation, is due to something carried there from a distant part of the system and lodged at the point of occlusion, we say it is due to embolism; if, on the other hand, a clot is formed locally at the spot occluded, we consider it is the result of THROMBOSIS. The result in either case will be the same to the substance of the brain unless the obstruction be removed. It must lead to deficient supply of nourishment within the area supplied by the occluded vessel, to softening, and to the

loss of functional power in the parts thus deprived of their nutriment. The symptoms which, however, characterise the first step of the occlusion—the wedging-in—vary somewhat. In embolism the onset is sudden and there are no premonitory warnings, but merely giddiness, or an involuntary cry, with immediate loss of consciousness. In thrombosis, the symptoms are slowly developed and preceded by pains in the head, general confusion, loss of memory, perhaps numbness. These show that the occlusion is complete, that the vessel is wholly blocked up. The further symptoms being dependent on the same circumstances, the two conditions must be the same. Hemiplegia may follow, or the paralysis may only affect the tongue, and there may be simply a loss of the faculty of speech. Further, it may be mentioned that thrombosis is usually associated with advanced age and feebleness of the heart's action; while in embolism there is valvular disease of the heart, which, of course, may occur at any age.

CHRONIC HYDROCEPHALUS can scarcely be mistaken for any other disease, as it consists essentially of an accumulation of fluid in the ventricles or in and beneath the arachnoid. The head is in consequence altered in form and enlarged in size, the fontanelles are open, the forehead prominent, and the face and body appear thin and wasted.

In many cases it is congenital, or the result of chronic inflammatory disease of the membranes, appearing generally about the sixth month, and lasting for a varying term of months or years, with a fatal termination either from exhaustion or coma.

Treatment.—Compression by means of adhesive plaster applied over the whole cranium seems serviceable; and if that fails, puncturing and drawing off the fluid may be tried. Cases have been recorded where mercury followed by iron was beneficial. Any tendency to this disease should be met by fresh air, regulated strengthening diet, and cod-liver oil. All attempts to exercise the brain should be discouraged.

ACUTE MENINGITIS.

By this is understood, in medical cases, acute inflammation of two membranes of the brain—the pia mater and the arachnoid. It is generally the result of exposure to great heat, spirit-drinking, mental anxiety, or retrocession of an exanthematous eruption.

Symptoms.—Headache, vomiting, and rigors usher in the disease, and are followed by fever, flushed face, red eyes, contracted pupils, and intolerance of light or noise. Delirium of a furious character is an early and pretty constant symptom. The tongue is coated, and the bowels are confined. If the disease is to terminate fatally, muscular twitchings ensue, sometimes convulsions, and the delirium merges into coma and collapse.

Treatment.—In the early stages, local blood-letting and an active cathartic are useful (F. 23). The head should be shaved, ice applied to it, and light excluded from the room. Beef-tea may be given at regular intervals. Calomel is recommended by some to be given every two hours until salivation is produced. Should mercury not be decided on, bromide of potassium, with or without the iodide, may be ordered in large doses. In cases where the patient cannot swallow, fluid nourishment may be administered by means of a tube passed through the nose.

TUBERCULAR MENINGITIS

(*Synonym*—Acute Hydrocephalus)

is a disease not uncommon in children under five years. The ventricles are found distended with serum, and the convolutions are much flattened. This characteristic appearance in post-mortem examinations led to its being called “acute hydrocephalus,” before it was understood that its essential causes were the tubercles. Grey miliary tubercles are formed at the base of the brain, and the presence of these excites inflammation of the mem-

branes along the course of the middle meningeal artery and its branches. These tubercles may be so minute as to defy detection unless a microscopical examination is made; they may be so abundant as to form large granular masses; or they may blend into cheesy patches of considerable extent and thickness. They appear to originate in the perivascular lymphatic sheaths of the small cerebral arteries, and they invade and partially block up the channels. Hence, intense hyperæmia is caused in collateral vessels, and the pia mater at the base of the brain is very vascular. The disease always terminates fatally.

Symptoms.—Tubercular meningitis is preceded by signs of failing health for some weeks or months before the attack sets in, which it does generally with obstinate vomiting and intense pain in the head. The child screams, the belly is drawn in, and there is great intolerance of light and sound. The temperature varies from 101° to 103° F. This may be called "the stage of excitement," which lasts from seven to fourteen days, and is succeeded by a "stage of depression" with a strong tendency to sleep. The child lies quietly on its back, its pupils are dilated, and it takes no notice of external objects. Occasionally there is a peculiar scream called the "hydrocephalic cry." Respiration is irregular and sighing, pulse low, temperature subnormal, and bowels constipated. This stage may last from two or three days to as many weeks, and is followed by a "stage of paralysis," characterised by the temperature again rising above the normal, by frequent and possibly violent convulsions, heavy dull eyes, paralysis, and coma.

In accordance with the pathology of the disease advanced, it may, generally speaking, be stated that the "first stage, that of excitement," depends on the implication of the pia mater at the base of the brain; "the second stage, that of depression," on the development of the hydrocephalic effusion; the "third stage, that of paralysis," on the gradual paralysis of the centres in the medulla oblongata. Convulsions, to a greater or less extent, may also be present during the whole course of the disease, and can-

not be referred to any one stage. Tubercular meningitis in its later stages simulates no other disease, yet at first it may be mistaken for typhoid fever more readily than anything else.

Treatment.—The line of treatment is indicated under “Tuberculosis,” and is simply prophylactic. When the disease has become established, it seems obvious, from the nature of it, that little improvement can be obtained. As the tubercles can never be absorbed, the disease is incurable. Niemeyer advocates iodide of potassium, and Hammond advises us to refrain from all leeching and mercurial purgatives, as only tending to make existence more intolerable.

TUMOURS OF BRAIN may be of various kinds—vascular, parasitic, cancerous, tubercular, syphilitic, etc.

The growth of a tumour is at the expense of the brain-substance, which in health nearly fills the cranial cavity, and hence pain, usually fixed and severe, is in the majority of cases a prominent symptom, and is accompanied by disordered sight, hearing, and taste. Convulsions, local paralysis, and giddiness are frequent concomitants. If the pain in the head is severe, fixed, and intense, and there is a history of syphilis, there is every probability of the tumour being a syphilitic gumma, and this surmise is strengthened if we find nodes on the superficial parts of the body.

ENCEPHALITIS is a local inflammation often followed by abscess. The part most frequently involved is the grey matter of the cerebrum or cerebellum, and the size of the affected area varies from that of a walnut to that of the closed fist. It is caused by injuries or by extension of inflammation from the ear, and is said always to terminate in death.

The symptoms during life are increase, and afterwards decrease, of the sensibility, headache, convulsions, and paralysis or coma.

SPINAL MENINGITIS.—Inflammation of the membranes

of the cord may be either acute or chronic, simple or tubercular. The non-tubercular form is generally caused by exposure to cold or moisture, or by injury. It is characterised by pain in the back, which is increased by movement and follows the course of the nerves proceeding from the diseased region; by spasms in the muscles of the back, causing rigidity of the spine; by unimpaired, often exalted, reflex motion; and by paralysis, varying in extent and intensity, but generally progressing to a fatal termination.

Pathology.—The lesions found after death are generally restricted to the pia mater and subarachnoid space, and consist in thickening of the membrane, turgidity of the vessels, and effusion of fluid or lymph.

MENINGO-MYELITIS.—This is secondary to the preceding affection as a rule, the spinal cord becoming congested and inflamed. The symptoms are pain in the spine, tingling of the extremities, and paraplegia, which is, however, rarely complete. Paralysis of the bladder and constipation are common; but there is no tendency to sloughing or wasting of the muscles. The result is sometimes recovery, sometimes permanent paraplegia.

MYELITIS.—Inflammation of the spinal cord may either be general, affecting the whole extent of the cord, or partial, restricted to a limited portion. It is more frequently the result of an injury than of anything else. The symptoms vary with the seat of the disease. The most prominent, however, are pain in the back, a feeling as of a tight cord tied round the body, rapid and complete paralysis, alkaline urine, a marked tendency to sloughing of the skin, speedy loss of electric contractility, and depression of temperature in the paralysed parts.

The termination of acute general myelitis is in death, sooner or later. In the partial variety life may be prolonged, but at the expense of loss of motion and sensibility below the diseased portions.

SPINAL IRRITATION.—The term spinal irritation seems

first to have been used by Dr. C. Brown of Glasgow in 1828. Its existence as a distinct disease has given rise to much controversy. Hammond, while retaining the term, thinks that it is due to anæmia of the posterior columns. It is specially recognised by the occurrence of tender spots in the skin or deeper tissues over one or more parts of the spine, and by neuralgic pains shooting over different regions of the back. It is peculiar to females of a weak habit of body between the ages of fifteen and twenty-five. "In general terms, it may be stated that any cause capable of reducing the system may produce spinal irritation." In doubtful cases, where it may be confounded with myelitis, meningitis, or congestion, it is said that a hypodermic injection of one-thirtieth of a grain of strychnia will settle the difference. This invariably aggravates the symptoms of the other diseases, while it is the efficient means of cure in spinal irritation. Should spinal irritation be diagnosed the principles of treatment are—

1. To remove any manifest causes of irritation, and to improve the general tone of the system by wine, oxide of zinc, and cod-liver oil.

2. To improve the special nutrition of the cord (supposed to be anæmic) by internal remedies, as strychnia, dilute phosphoric acid, and syrup of orange (F. 80a); and by external applications in the form of counter-irritants, as blisters, tartar emetic ointment, and dry cupping.

If there is vomiting, light nutritious food in small quantities should be given, with citras caffeinæ 5 grains, or oxalas cerii 2 grains, thrice daily in water.

INFANTILE SPINAL PARALYSIS is generally ushered in with fever, convulsions, and pain in the back, the latter marking the seat of the disease as being in the spinal cord. Then, it is noticed that the child does not use one hand or kick with one leg; or the paralysis observed may be restricted to a group of muscles, or it may embrace all four limbs. The temperature of the affected parts is lower than that of the corresponding sound ones. This

loss of power may last a month or six months, and it is succeeded by atrophy with loss of the electric contractility of the affected muscles, and in some cases even by arrest of development and degeneration of the bones. An inflammatory softening, the essential lesion, appears to affect the anterior horns of grey matter, and to lead to degeneration and atrophy there.

Treatment.—This is local and general. The induced current should be applied directly to the skin over the paralysed muscles; and, afterwards, friction with a dry towel or flesh-brush should be practised several times in the course of a day. Ergot should also be given in ten-drop doses of the liquid extract thrice daily, and this may be increased up to half a drachm. If the stage of atrophy is reached, ergot is useless, and strychnia must be administered (F. 80), while the use of the induced current should be persevered in as long as muscular contractility continues. "If this is lost to the induced current, the cure will be difficult and the treatment protracted; if the primary current is also powerless, a cure is impossible." (Hammond.)

SOFTENING OF THE BRAIN.—This depends chiefly on vascular obstruction—thrombosis or embolism, which gives rise to a pathological state of brain-tissue known as softening. This is indicated during life by mental, motor, and sensory symptoms, which vary according to the seat of the lesion.

The predisposing causes of this obstruction, leading to the vascular change and resulting in imperfect nutrition of that part of the brain-tissue, are generally valvular disease of the heart, chronic Bright's disease, chronic alcoholism, and syphilis. The most common cause is undoubtedly *senile vascular degeneration*, and hence the disease is met with most frequently in old people, while in the young and middle-aged, when it occurs, it is due to embolism through valvular disease, or to thrombosis from syphilis.

Certain terms are still retained in speaking of cerebral

softening, viz. *white or grey softening*, *red softening*, and *yellow softening*. These terms are engrafted on the old idea of inflammation being the cause of the disease ; but this idea is now abandoned.

The "white softening" simply means a diminution of consistence in the affected area, its colour remaining unchanged. This softening may be succeeded by another change, in which, by distension and rupture of the capillaries, blood is extravasated, and "red softening" ensues. After a time the effused blood becomes altered in colour to "yellow" or "orange," and "yellow softening" is produced.

The symptoms may come on suddenly and with unconsciousness ; but the loss of consciousness rapidly disappears, and as a rule is succeeded by convulsions resulting from collateral hyperæmia. In the old, delirium may be the chief symptom. Recovery is often incomplete. Hemiplegia may remain, or we may have loss of memory, affection of the speech, drowsiness, and slowly advancing paralysis.

Chronic softening may follow on the acute, or it may have a gradual onset, marked by such symptoms as headache, numbness, illegible handwriting, and actual imbecility. These symptoms depend upon degeneration of the brain, commonly due to arterial disease. An intercurrent disease, as a pulmonary affection, frequently cuts short the life of the patient.

Treatment.—The treatment of the acute form is embraced in what was stated under apoplexy. The chronic type requires nervine tonics, arterial tension being diminished by a careful regulation of the diet and avoidance of any excess ; also by prompt purgation if any increase of tension is observed, as when the eyelids are swollen in the morning and when there is a sensation of fulness in the head (F. 23, 25, 27).

SOFTENING OF CORD.—Spinal and cerebral softenings probably own a similar mode of origin ; yet the frequency of thrombosis is more apparent in the cord than in the brain. The blood supply of the lower end of the cord is

easily interfered with, and the anatomical conditions there favour the occurrence of thrombosis. The softening resulting may be "complete" in any of the regions of the cord, or it may be limited to certain portions and constitute "incomplete transverse softening," or it may be central and almost confined to the grey matter as "diffuse central softening." When the white columns as well as the grey are involved it is called "diffuse softening," and when only a part of the transverse area of the cord is attacked it is termed "circumscribed softening." When the foci, seen in circumscribed softening, are scattered through different parts and regions of the organ, it is known as "disseminated softening."

Microscopical examination shows invariably in softening of the cord *large granulation corpuscles* and oil-globules replacing the nerve-tubules in the white substance, while the nerve-cells in the grey substance are destroyed. The specific gravity is also lower by 3.5 degrees from the normal standard of 10.33 to 10.41 in healthy individuals.

In extreme cases the degeneration is so complete that the whole substance of the cord is reduced at the affected site to a dirty-looking milky fluid, which, when the membranes are cut across, flows out so as to leave a gap in the cord-substance for an extent, it may be, of one to three inches (Quain).

The symptoms of softening of the cord vary according to the situation and extent of the degeneration. Generally speaking, the first symptom observed is numbness of those parts of the body below the seat of lesion. This is followed by want of motor power, and, the two advancing together, they become more and more marked. The disease progresses to utter helplessness. The functions of the bladder and bowels are interfered with, and intractable sloughing bed-sores form over the sacrum. The inflammation may extend to both ureters, so as to implicate the pelvis of the kidneys, and cause minute abscesses in the kidney itself. Death usually occurs from sheer exhaustion, hastened by some intercurrent affection of the lungs.

SCLEROSIS.

Synonym—Chronic interstitial inflammation, called grey degeneration.

In contradistinction to softening of the brain, it is convenient here to consider an affection which of late years has attracted considerable attention. In order to understand what is meant, it is well to remember that, in the nervous tissue of the brain or spinal cord, there is, besides nerve-cells and nerve-fibres, another element present, which binds these together and gives the whole substance its normal degree of consistence. This substance fulfils, to all intents, the purposes of connective tissue in other organs of the body, and has been termed *neuroglia* or *nerve-cement*. In sclerosis, this tissue is increased or hypertrophied, the proper nervous substance being in consequence compressed and atrophied. The result is increased hardness and density over a greater or less extent of the nervous system. Hence, different names are given. Thus, if it involves both the brain and spinal cord, it is called "multiple cerebro-spinal sclerosis"; if brain alone, "multiple sclerosis"—the sclerotic or hardened parts in these two cases being diffused through the respective areas mentioned as plates or nodules of varying size, and to a certain extent circumscribed; while, in a third form, affecting the brain and termed "diffuse sclerosis," there are no such boundary lines, the hardness affecting one lobe or even a whole hemisphere. Without entering further into a subject which may be said to be still in its infancy, it may be useful for the student to recollect that diffuse sclerosis commences in childhood and always terminates in imbecility, often in idiocy; multiple cerebral sclerosis is a disease of male advanced life, is evidenced by pain and trembling of individual or combined muscles of arms, hands, or other parts, and is followed by paralysis, which ultimately extends to the trunk; in multiple cerebro-spinal sclerosis, paralysis is noticed before trembling, the latter being only evidenced when a voluntary movement is made.

PARALYSIS AGITANS.—Shaking Palsy, Paralysis Agitans, is now recognised as a distinct affection of advanced life, characterised by an insidious beginning, but, when fully developed, exhibiting mainly tremors of the limbs and inability to walk slowly, though ability to run or plunge easily forward in a jog-trot style to any tangible object may remain. This mode of progression is now termed “festination.”

The cause evidently exists in the nervous centres, but there is no distinctive lesion; sclerosis may be present, but it is supposed to be mainly a coincidence.

The disease progresses slowly, and may last over several years before attaining its full development. In the last stage the patient is confined to bed; muscles waste, tremors cease, mental powers decline, and general prostration ensues, death being due to asthenia or some intercurrent pulmonary affection.

Treatment.—No treatment seems to be of any avail. The disease is incurable.

WASTING PALSY, PROGRESSIVE MUSCULAR ATROPHY.—In this peculiar disease, loss of strength in certain muscles of the body, particularly those of the shoulders, arms, and hands, first attracts the patient's attention, and this is followed by atrophy of the muscular tissue, not merely of the parts primarily affected, but progressing until every voluntary muscle of the body may be involved, with the exception of the muscles of the eyeball and the levator palpebræ superioris. The affection seems peculiar to males from twenty-five to thirty-five years of age, and, in some instances, to be hereditary. The cells of the anterior tract of grey matter of the spinal cord appear to be destroyed by a slow chronic inflammation; and the presumption is, since the disease is unaccompanied by paralysis, that the cells involved are not motor cells, but those which are supposed to govern the nutrition of muscles—trophic cells. The prognosis is very unfavourable, especially if the disease is hereditary.

Treatment.—This must be based on the steady em-

ployment of the continuous and interrupted currents, with the administration of tonics, or of iodide of potassium if there is any suspicion of syphilis.

"**PARALYSIS SPINALIS SPASTICA.**"—This peculiar form of paralysis may be fitly termed Erb's Spastic Paralysis, from the accurate description first given of it by Erb of Heidelberg. The clinical features of the disease in a case which came under my observation were, gradually increasing paresis and paralysis in a female aged thirty-six, after a prolonged labour. The affection was located in the lower extremities, and was characterised in its advanced stage by muscular tension and reflex contractions, to such an extent that the legs could not be separated at the knees, and the heels were drawn up so as to touch the buttocks. There was no loss of sensibility and no wasting of the muscles. There was complete control over the bladder and rectum, and the intellect was clear and unimpaired. She was doomed to permanent "lying still," but she suffered no pain, and in the condition described gave birth to a healthy child. In the early period of the disease the spastic gait was marked, and consisted in a clinging of the feet to the ground, so that movement was stumbling and uncertain. This was followed by a tiptoe hopping progression, the heel never being planted firmly, and by the body being bent forwards.

Charcot concludes that there is a sclerosis, not of the anterior or posterior columns, but of the lateral columns of the spinal cord; but he has not been able to obtain confirmatory post-mortem evidence. Dreschfeld, however, has succeeded in this important item, and we are therefore thoroughly justified in recognising spastic spinal paralysis to be a primary sclerosis of the lateral columns.

LOCOMOTOR ATAXY

is a peculiar form of paralysis due to disturbed co-ordination of muscular movements. In health, the muscles must contract and relax in unison with the movements

we may desire. If one muscle contracts too soon and another relaxes too quickly, then there is disturbed co-ordination of muscular movements.

Etiology.—The cause of locomotor ataxy is obscure, yet undue exposure to cold or damp after a long journey, venereal excesses, mental exhaustion, and syphilis seem in some cases to lead to its occurrence.

It is especially a disease of males, and is rarely met with in youth, usually occurring between the ages of thirty and fifty years.

Symptoms.—The onset is insidious. The first suspicion of there being anything wrong is frequently awakened by an inability to run, through a feeling of the legs being too heavy. This is followed by fatigue after any exertion, and by increased micturition. The desire for sexual intercourse is at this stage of the disease increased. Dr. Althaus mentions as one of the earliest symptoms the inability to walk backwards. The disease progresses often slowly, and months or years may intervene before the patient presents the well-marked symptoms of locomotor ataxy, viz. a straddling gait in movement, the foot being lifted high in the air and planted down heel first. To support his balance the patient grasps at anything that may be near, as a friend's arm or a convenient chair. He is unable to walk in the dark, or with his eyes shut. A feeling of constriction is also complained of, as if a cord were drawn tightly round the abdomen.

In severe cases the patient cannot stand steadily, certainly not with his eyes shut, nor can he walk on a narrow board, the breadth required being a gauge of the severity of the affection. Usually there is diminished tactile and muscular sensibility of the lower extremities, with numbness or formication. These symptoms may be preceded by transitory pains, as well as by fleeting phenomena referable to the cerebrum—amaurosis, difficult deglutition, etc. Electro-muscular contractility remains intact to the last. There is neither palsy nor wasting of the muscles; and, if the patient is placed on a chair, you cannot bend his legs against his will.

In health, if a smart tap is made on the patellar tendon while the legs are hanging loosely over the side of the bed, the foot is immediately projected forwards (Westphal's test). In locomotor ataxy this phenomenon is absent. The stroke may be made either with the hand or a cane, but no response is elicited, thus indicating that reflex action, through disease of the cord, is in abeyance.

The eye symptoms observed in certain cases of locomotor ataxy may be summarised as—

1st, Insensibility of the pupil to light, while it acts with accommodation—Argyll-Robertson's phenomenon.

2d, Frequently there is atrophy of the optic nerve.

As the disease progresses it does not stop at the legs, but creeps upwards. Arms, hands, and fingers are involved. The coat cannot be buttoned, the pin put into the cravat, nor the spoon carried to the mouth. The urine is passed involuntarily in bed, and now the sexual power and appetite are diminished. Thus the patient may remain for years. Ultimately, the lower extremities become thinner, emaciation attacks the whole body, and death results from general weakness, consumption, or other intercurrent disease.

Pathology.—The spinal cord is invariably altered in structure. Generally the membranes are much congested and thickened posteriorly by exudation, and adherent to each other and to the posterior columns. The distinct lesions are, however, in the posterior columns, especially in the posterior root-zones, and the nerve-roots are the parts chiefly affected. The morbid change consists of atrophy and disintegration of the nerve-fibres with hypertrophy of the connective tissue. Oil-globules surround many of the blood-vessels. The pathological change seems to travel from the centre to the periphery, from the spinal cord to the posterior roots. In the cerebral nerves an opposite direction is assumed, centripetal instead of centrifugal.

An interesting explanation of the phenomena and pathology associated with locomotor ataxy has recently been brought forward by Dr. Althaus. It is known that the posterior columns of the spinal cord consist of two different systems—first Burdach's,

which may be looked upon as short conducting paths ; and secondly, Goll's columns, which are made up of long conducting paths. Burdach's columns are direct continuations of posterior nerve fibres, connecting the cord with peripheral parts, and thereby associated with external influences. They also send out numerous fibres, which proceed in various directions into the central grey matter, and which are evidently intended to connect the different segments of grey matter with each other ; while others proceed upwards to the medulla oblongata, where they terminate.

Goll's columns, on the other hand, are long conducting paths, which proceed from the central grey matter up to the medulla oblongata, and appear from their anatomical peculiarities intended to connect extra-medullary centres in the brain and cerebellum with physiologically identical fibre-systems at different levels of the cord.

If all these commissures existing between extra- and intra-medullary centres are in a healthy condition, then the nervous system by outward tests can show no traces of disease such as have been mentioned as diagnostic of locomotor ataxy. If, on the other hand, various of these commissures are attacked by disease, then there must be want of consensus of functional activity and harmony. If it could be proved that the posterior columns contained centres of co-ordination, then everything connected with the pathology of locomotor ataxy would be comfortably settled. Unfortunately, experimental physiology shows no such centres in the whole extent of the cord, but they are said to exist in the brain, more particularly in the corpora quadrigemina, the optic thalamus, and the cerebellum.

It is assumed, therefore, that these central ganglia have the special function of rendering mechanical and automatic active movements, which are connected with sensations and, in the first instance, are only excited by conscious volitional effort. Thus, the child in attempting to walk has at first to be guided by countless conscious efforts on the part of the hemispheres. Vision is exerted in noting the movements of the feet, and mechanical support is made use of, as by a chair or a friendly hand. By and by, the child, becoming stronger and more confident, is able to dismiss these media of accurate information, and to conduct its movements with confidence and rapidity, as it were automatically, and without any attention to them on the part of the grey substance of the brain. Thus, in after life, complex movements are easily and unconsciously performed, as in writing or finished piano- and violin-playing. In order, however, that the central ganglia should thus minimise the work which has to be done in life, it is necessary that they should receive accurate information as to the position of our limbs and the nature of the obstacles with which the latter come in contact.

We may be able to walk on a smooth level path without thinking of it; but, if the path is unpaved and rough, if it lie on the edge of a precipice, or lead through a crowded thoroughfare, then a considerable amount of attention is necessary to overcome obstacles and proceed with safety. We have to use our eyes then. We have to manœuvre with our arms and hands. We have impediments to overcome, and we cannot get on as we do on a smooth level road. The ataxic is by disease always in the condition in which, as has been exemplified, a healthy man may occasionally be placed. The road is always rough to him. He cannot trust to information afforded to him by the posterior columns communicating with the central ganglia. They have been sapped by disease, and the various ganglionic cells can no longer be depended on for orderly action. There is no longer any harmony between the muscles which act and their antagonists which regulate their action; hence, wrong groups of muscles are called into play, impairing action instead of facilitating it. In this way, if the premises are admitted, the production of locomotor ataxy may be satisfactorily explained.

The phenomena of static ataxy, associated with tabes, remain however to be accounted for. Here it is supposed the cerebellum plays an important part as the centre of the equilibrium of the body. Removal of the cerebellum causes static ataxy; the animal cannot keep steadily on its legs, but, staggers about as drunk. The behaviour of the animal in this condition is exactly reproduced when the ataxic patient attempts to stand on one leg or on both with his eyes closed.

The conclusion therefore come to by Dr. Althaus is, in his own words, this—"We may, however, take it as an indisputable fact that locomotor ataxy is caused by an interruption of the paths between the posterior roots and the central ganglia of the brain, through sclerosis of the posterior columns, and that static ataxy is, in its turn, brought about by an interruption of the paths between the posterior roots and the cerebellum, through sclerosis either of Goll's column or of the direct cerebellar strands."

I have given the views of Dr. Althaus because I think they present an interesting and intelligent explanation of the leading phenomena of locomotor ataxy. They are, however, disputed by Dr. Wilks, who asserts that we have not as yet any groundwork of pathological evidence which will explain the varied symptoms of the malady, and to such an extent has this conviction grown upon him, that he asks in the *British Medical Journal* of 18th October 1884,—“Is there a disease tabes or locomotor ataxy?”

Treatment.—In the early stage of the disease it is advisable to use simple wet rubbings with water (beginning

with 77° Fahr. and going down to 68°), and half baths about 86° to 70°, with simultaneous sprinkling and washing of the back. Associate these with a careful and prolonged use of electricity by means of the constant current, and endeavour to secure the action of the single poles upon the entire extent of the cord. Thus, place both poles on the vertebral column, one at the nape of the neck, the other at the lumbar region. Then one pole, say the lower, being fixed, the other may be moved quite slowly down over the back and thus brought in contact with the greater part of the cord; and likewise the upper being fixed, the lower may be gradually carried over the major part of the cord. The application should not exceed three to six minutes daily, and a strong current should be positively avoided. The treatment should be persevered with for months, and should only be discontinued if the patients feel more tired and weak after each application, if their condition as a whole grows gradually worse, if the pains increase, or if sleeplessness sets in.

In more advanced cases, nitrate of silver has proved beneficial, one to one and a half grains being given in divided doses in the course of a day, and the remedy may be continued until 120 grains have been used. Bromide of potassium in some instances relieves the pain, while strychnia is decidedly objectionable, and the use of belladonna and ergot has not been attended with much success. In more advanced and completely developed cases, it is better to refrain from all useless attempts at any curative treatment, and simply attend to symptomatic indications, as, relieving the constipation by enemata or appropriate diet, assuaging the lancinating pains by subcutaneous injections of morphia, and seeking to secure as comfortable a life as may be for the victim of an incurable disease. Some physicians have recently spoken highly of nerve-stretching in relieving the boring pains and in arresting the progress of the disease. The nerve selected is the sciatic.

HEAT-STROKE.

Coup de soleil and heat-stroke are synonyms applied to a disease prevalent in warm climates, but occurring also in this country. Two forms are observed, one in which the disease is due to the direct influence of the sun's rays, the person being struck down suddenly, with stertorous breathing, slow, full pulse, unconsciousness, and marked heat of the head. In the other form, excessive heat without exposure to the sun may, by some blood-change, produce phenomena similar to syncope, with weak pulse and no stertor of the breathing.

Nothing characteristic is detected in the brain after death.

Treatment.—Apply ice or iced-water freely to the head, which should be raised. Afterwards leech or cup behind the ears, and administer a purgative enema for the first form, the true *coup de soleil*. For the second, cool the body by means of cold douches; afterwards apply sinapisms to the spine, epigastrium, and limbs; and administer stimulants. Inject quinine hypodermically (see F. 11d).

SUB-SECTION 2.

APOPLEXY (*Synonym*—Stroke)

is a term significant chiefly of a prominent symptom in three affections of the brain—embolism, thrombosis, and cerebral hæmorrhage. It denotes a clinical fact, a stroke, a beating-down suddenly; and, as this was accompanied by loss of consciousness and motor power, with stertorous breathing and peculiar countenance, older writers attempted to establish and did name as a disease what is in truth only a symptom. They distinguished between several varieties, as, “sanguineous,” “nervous,” and “serous apoplexy.” This nomenclature has now been abandoned, and the various clinical phenomena are classified under the term “an apoplectic attack.” The question

may be asked, Is it possible to distinguish between the causes which may produce this? The answer to this question is that the diagnosis is always doubtful, but something may be learned from a careful examination of the state of the heart in certain cases, from the inspection of the peripheral arteries, from the mode of onset of the attack, and from the parts that are left paralysed.

A person may, however, be discovered in an unconscious state, resembling an apoplectic seizure, and it is of great importance that a diagnosis should, if possible, be clearly established, as serious mistakes may otherwise occur. This unconsciousness may be due to drunkenness, to uræmia, to narcotic poisoning, to epilepsy, or to concussion from a fall or blow. In all cases the history will form a marked determining distinction, and especially is this true in the last two; for, if dependent on epilepsy, the attack will not be long and there will be an account of former seizures; if due to concussion, there may be injuries or bruises on other parts of the body, probably bleeding from the ears or nose, and other circumstances tending to the supposition that the insensibility is due to injury wilfully or accidentally inflicted. In drunkenness the patient can be aroused to some extent, the insensibility not being complete; there is no hemiplegia, and the smell of the breath will betray alcohol. As drunkenness and an apoplectic seizure may, however, exist together, the diagnosis should be guarded; and, if a doubt exists, it is better to err on the safe side and act as if they were combined. In uræmia, there is no hemiplegia; the urine, if drawn off by a catheter, will be found to be albuminous; and there will in all probability be indications of dropsy in other parts of the body.

In narcotic poisoning the pupils are contracted, there is no hemiplegia, and there are no remissions in the insensibility, but, on the contrary, deepening coma.

In all doubtful cases it is advisable to use the stomach-pump.

Treatment.—The general treatment recommended under cerebral hyperæmia should be adopted when an apoplectic

seizure appears imminent from flushed face, vertigo, buzzing in the ears, or flashes before the eyes. If the cerebral congestion is active, wet-cupping over the nape of the neck, or leeches to the temples or inside the nostrils, often give relief. Cold to the head, mustard poultices to the feet and epigastrium, and bromide of potassium, gr. x. thrice daily for about ten days, followed by liquor arsenicalis, m. iii. to m. iv. for five weeks, are other preventive measures.

During the apoplectic seizure the patient should be kept quiet, croton-oil in m. ii. doses placed on the tongue, the urine drawn off, the head elevated, and the temperature of the room kept at 60° Fahr.

If the patient is found with face flushed, breathing stertorously, temperature above 100°, respiration and circulation largely disturbed, bleeding should not be put in force, as it does not seem reasonable to suppose it can reduce the clot already formed on the brain. But, if the pulse be not very rapid—little more than 100, and if it and the respiration are regular, bleeding may, and often does, relieve the tension in the cerebral circulation, and may be practised without delay.

When the acuteness of the symptoms has diminished and consciousness has been restored, probably with hemiplegia, we must remember that there is still serious mischief in the brain in the form of a blood-clot. Therefore, all excitement must be avoided, the bowels regulated, the diet simple, and time and nature trusted to in gradually removing the effusion. Nothing can be worse in the convalescent stages of acute apoplexy than energetic medicinal treatment or misapplied electricity.

PARALYSIS.

Synonym—Palsy.

Paralysis or palsy denotes loss of motor power and sensibility in one or more parts of the body. The loss of motor power in the parts affected, the most striking characteristic, may vary from the slightest feebleness to the most

complete inability to perform any movement. The former, the incomplete variety, is now often termed "paresis," while "paralysis" is reserved for the complete or nearly complete form. Paralysis may be general or partial, as the whole or only part of the body is affected, and various names indicate when the paralysis is only partial. Thus, when it is limited to one side, it is termed "hemiplegia"; if confined to the lower half of the body, "paraplegia"; if only affecting a small portion of the body, as face, foot, or leg, it is designated "local paralysis"; and, if the nerve specially implicated in causing this is known, it can be fitly designated accordingly, *e.g.* "facial paralysis," and "paralysis motor-oculi." Again, paralysis may be due to certain occupations—hence the names "mercurial paralysis," "lead paralysis"; or, if associated with certain symptoms, it is known by these—hence "wasting paralysis," "paralysis agitans."

The student ought to be familiar with the characteristic gaits or walks in nervous affections, for from them a differential diagnosis may be made. There are three leading varieties :—

1. The "paretic and paralytic gait," caused by a more or less extensive palsy of the lower extremities. The gait is shuffling, the tip of the foot drags on the ground, and the sole is planted awkwardly, usually with the outer edge first. The patient walks with the aid of canes, or requires the support of crutches or attendants. He may be able to stand thus securely ; but, when left alone, he in most cases simply sinks to the ground.

2. The "ataxic gait," due to disturbance of co-ordination in the legs. The movements are hurried and characteristic. The point of the foot does not drag. It is thrown forward and outward, and the heel is brought down with a decided stamp while the leg remains stiff at the knee. The patient's eyes are directed to his feet, as in this way he can stand without inconvenience. But, if his attention is directed to the ceiling, he totters and falls ; and the same thing occurs if, when walking, he is asked to turn round quickly.

3. The "stiff spastic walk," due to reflex muscular contraction or tension associated with paresis of the legs. The legs are dragged. The feet seem to cleave to the ground, and the tips appear to find inequalities even on a level surface. Every step is accompanied with a hopping movement of the body, which is slightly bent forward. The tendency is to walk on tiptoe, and there is no throwing about of the feet.

Generally speaking, the first variety is dependent on disease of the anterior columns of the cord; the second, of the posterior; while the third involves the lateral columns. The first two are often seen; the latter is rare.

HEMIPLEGIA.—This is generally spoken of as "a paralytic stroke;" and, though it may be associated with many of the affections previously mentioned, it is most commonly due to hæmorrhage into the brain-substance. As the result of this or of some of the other cerebral diseases, the left side of the body is most commonly found paralysed, although the actual seat of the lesion in the brain is on the right side in the great majority of cases. The decussation of the pyramids accounts for this phenomenon. Owing to the affection of the facial nerve, the cheek hangs loosely with the angle of the mouth slightly drawn upwards to the sound side; and the tip of the tongue, by the action of the healthy hypoglossal, is pushed to the paralysed side when it is protruded, the counterbalancing power of the corresponding muscles being lost. The articulation is imperfect, and, if the third nerve is also involved, the upper eyelid droops, the pupil is dilated, and there is a divergent squint. The loss of motion may be complete in the arm and leg, and the patient lies in bed helpless. If it is partial, or if the original attack is being recovered from, the gait is peculiar, the affected leg being drawn after the sound one in a shuffling way, with, if the patient is able to lift the foot so far, the toes pointed to the ground. In most cases there is loss of sensibility as well as motion.

Hemiplegia may be permanent, or it may tend to recovery, which commences in the leg.

POST-HEMIPLEGIC CHOREA.—Chorea sometimes succeeds hemiplegia in the paralysed parts. Sometimes, with facial hemiplegia, there is chorea of the limbs of the same side. Speech is occasionally lost for a time, or it may be seriously but not completely affected. In a few cases true aphasia has been noted; and, when present, it is associated with right hemichorea. The face may assume an imbecile appearance, and in violent and fatal forms there is delirium.

Treatment.—Two weeks after the original seizure, but not sooner, it is by some recommended to use friction over the paralysed parts daily, with flexion and extension of the joints. Subsequently, the subcutaneous injection of strychnia is recommended, or preparations of phosphorus (F. 85) may be taken internally. While the constant current is a valuable agent in most cases of hemiplegia, yet it is to be remembered that faradisation of the muscles is especially indicated where rapid loss of irritability indicates probable wasting.

PARAPLEGIA has usually an insidious commencement, the feet and legs having felt for some time weak, cold, or tingling. As the disease advances, the weakness increases, sensibility and power of motion are gone, control over the bladder and rectum is lost, and the patient is obliged to remain in a horizontal position. Rest is frequently disturbed by involuntary movements of the limbs.

Paraplegia may be due to caries of the vertebræ, or to concussion, compression, congestion, inflammation, or softening of the spinal cord or its membranes. It may also accompany other affections, as hysteria, pregnancy, worms, or urinary diseases. The history must be the chief guide to the diagnosis as to whether the paraplegia is primary or secondary, or whether it is dependent on congestion or diminished nutrition.

Treatment.—If, from the nature of the symptoms, it is considered that congestion, or too much blood being sent to the cord, originates the paraplegia, it is desirable to administer the ergot of rye internally and apply belladonna

externally (F. 71a). Both these remedies contract the vessels of the cord and membranes. If, on the other hand, there are evidences of malnutrition or of reflex paraplegia, strychnia is to be preferred, and it should be combined, if there is much restlessness, with opium, and a generous diet ordered. In addition to this, if the paraplegia seems of reflex origin, the cause should, if possible, be removed. Thus worms must be expelled, the bladder relieved, and hysteria obviated.

FACIAL PARALYSIS, or BELL'S PARALYSIS, is an affection of the portio dura or facial portion of the seventh pair of nerves, either at its origin or in its course, as the result of pressure. The appearances are characteristic, as there is paralysis of motion, more or less complete, of the muscles supplied by the nerve. Hence, the face has a blank unmeaning expression. The eye of the side affected cannot be closed, tears run over the cheek, the mouth cannot be pursed up to whistle, nor expanded to smile. In accordance with the distribution of the facial nerve, it will be found that if the morbid process originates above the origin of the chorda tympani nerve, there will be a diminution of the sense of taste in the corresponding side of the tongue; if behind the gangliform enlargement of the petrosal nerves, there will be, in addition to the other symptoms, paralysis of the parts supplied by these—the uvula will be drawn to the sound side, and the palatine arch will fall down and become straight instead of curved.

By the facts that the tongue is unparalysed and deglutition unimpaired Bell's paralysis is distinguished from glosso-labial paralysis; and, by the fact that the patient cannot close the eye, from the facial paralysis of hemiplegia. Facial paralysis is often the result of cold, debility, or syphilis, and tends to recovery in from six to ten weeks. If it is dependent on a cerebral or intracranial lesion, the prospect of cure is remote.

Treatment.—The persistent use of electricity is of great importance, one pole of the induced current being

placed over the point of exit of the nerve, while the other is applied in succession over the various muscles supplied by it. The healthy nutrition of the system should be secured by hygiene and tonics, especially strychnia. If there is reason to suspect a syphilitic taint, give iodide of potassium and mercury (F. 1).

PARALYSIS OF THE THIRD NERVE, MOTOR-OCULI.—The paralysis of this nerve depends upon tumours or exudations pressing on it, or it is the result of cold or reflex irritation, such as worms or indigestible food. The upper eyelid in consequence falls down, occasioning the condition termed ptosis; and, if the paralysis is of intracranial origin, the eyeball is turned outward and the pupil is dilated.

If due to cold and not dependent on cerebral causes, recovery is the rule.

GLOSSO-LABIO-PHARYNGEAL PARALYSIS (*Synonym*—*Bulbar Paralysis*).—The essential lesion here is found in the medulla oblongata and upper part of the spinal cord, and consists of atrophy of nerve-cells connected with the origin of the hypoglossal, spinal accessory, and pneumogastric nerves. As a consequence, there is a slow yet steady loss of power of the muscles of the tongue, soft palate, pharynx, and larynx, and also of the orbicularis oris. The disease, dependent on unknown causes, invariably results in death from asphyxia or cessation of the heart's action through implication of the cells of the pneumogastric centre.

ACUTE ASCENDING PARALYSIS.—This is a puzzling and very serious disease of the spinal cord, first definitely described by Landry in 1859; characterised clinically by paralysis ascending rapidly from below upwards, until the medulla oblongata is reached; characterised anatomically by its leaving no pathological evidence of any change in the spinal cord or brain.

Etiology.—The causes are obscure. Exposure to cold and syphilis have been noted as exciting causes, and the

disease has also occurred during convalescence from an acute febrile malady. The time of occurrence is between twenty and forty, and the male sex are attacked more frequently than females.

Symptoms.—Weariness of the limbs and numbness in the hands and feet may be the first direct evidence of the disease. Afterwards, at a short interval, there is extreme weakness of the lower extremities followed by actual paralysis. This paralysis is seen first in the distant portion of the limbs and gradually approaches the trunk, so that in the course of a few days paralysis of the lower extremities is complete.

The trunk muscles are next and soon implicated. The patient is unable to sit up. Constipation exists, and defæcation is interfered with through weakening of the abdominal muscles. Respiration is also affected; next the upper extremities are involved, paralysis commencing at the distant extremities and extending until the whole body becomes paralysed.

THOUGH THE MUSCLES ARE LAX THERE IS NO ATROPHY; AND THE ELECTRICAL REACTION OF NERVES AND MUSCLES CONTINUES PERFECTLY NORMAL.

Sensibility is not impaired, and there is no tendency to the formation of bed-sores, neither is there any increase of temperature.

In one-third of the cases noted the disease may be arrested, recovery taking place and power being shown first in the arms, second in the trunk, third in the lower extremities. In two-thirds of the cases the disease progresses, and ultimately the patient dies of asphyxia. Death may occur in three or four days, or not until as many weeks have elapsed.

Diagnosis.—The absence of fever, and its involving the medulla and producing a rapidly fatal issue, distinguish this disease from acute spinal paralysis. From chronic spinal paralysis it may be diagnosed by the absence of atrophy of the muscles, and by their electrical condition not being lost.

Treatment.—Treatment, in the absence of pathological

lesions, can only be empirical. Gentle shampooing of the limbs has been recommended, together with brief daily applications of weak faradic currents to the affected muscles. A combination of iron and arsenic has been suggested, and the cautious administration of strychnia.

TOXIC PARALYSIS OR LEAD-PALSY.¹—Colic is accompanied by severe twisting pain, especially about the umbilicus. This pain occurs in paroxysms, is unaccompanied by fever, and is relieved by pressure. The bowels are usually found to be constipated, and bile or mucus may be vomited during the attack.

As various diseases of the abdomen have pain as a prominent feature, it may be asked, What significance for diagnostic purposes has such pain?

In reflecting on this it is useful to remember that the pain of peritonitis is persistent, increased by pressure, and general over the abdomen; the pain of the passage of a gall-stone has a localised area in connection with the gall-bladder, and the vomiting is generally severe; the pain of a urinary calculus is in the back and testicle, with frequent micturition; the pain of hernia is attended with hernial protrusion.

A peculiar kind of colic attacks painters, or those engaged in occupations which bring them into frequent contact with white lead. The pain is, however, more severe than in ordinary colic, the constipation is great, and a peculiar and characteristic blue line is observed round the edges of the gums. These symptoms are followed, in advanced cases, by actual paralysis of the extensors of the wrist and fingers and wasting of the ball of the thumb, constituting what has been termed "the drop wrist."

Treatment.—As colic is generally attended with constipation, and can only be remedied by its removal, it is necessary to give aperients, such as are recommended in the chapter on constipation. An enema is also often

¹ For convenience this form of colic, ending frequently in paralysis, is inserted here instead of under Diseases of the Intestines.

beneficial, followed by opium; or electricity may be tried. For lead colic, iodide of potassium must be given (F. 5).

"PSEUDO-HYPERTROPHIC PARALYSIS."—This is a peculiar form of paralysis generally affecting boys, in which the ultimate fibres of the muscles atrophy and are replaced by interstitial fat and fibrous tissue, so that the muscles seem actually hypertrophied.

It affects generally boys, and it is in some cases considered hereditary; children of the same family may similarly suffer. The false muscular development begins frequently at the period the child should walk.

The first muscles attacked are those of the leg and lower part of the back, particularly the gastrocnemii, the flexor muscles of the thigh, and the erectores spinæ. These muscles seem firm, hard, and increased in size. But if a portion of the muscle is removed by the "*emporte-pièce*" of Duchenne it will be observed that the muscles are actually atrophied and that the increase in size is due, as previously stated, to the interstitial development of fat and fibrous tissue. As the disease progresses, other muscles besides those mentioned suffer. Thus the muscles of the trunk, upper limb, and face become in the same way affected; and, in some instances, the non-development of fat makes the condition appear to be simply one of atrophy.

Ultimately, when the disease has advanced, the whole of the voluntary muscles degenerate and become more or less atrophied; and after death it is found that the diseased muscles are in a great measure replaced by fat cells, only a few muscular fibres remaining.

Pathology.—Diversity of opinion exists as to the pathology of this disease. Charcot and Cohnheim have failed to discover any alteration in the nervous system, but Lockhart Clarke and Gowers state that they have observed extensive degeneration of the grey matter at each lateral half of the spinal cord and in the anterior commissure. Some pathologists assert that the disease is essentially progressive muscular atrophy, with this difference

that pseudo-hypertrophic paralysis begins in the lower extremities.

Symptoms.—The first marked sign, observed when the child is stripped, is the enlargement of the calves, and this generally contrasts greatly with the emaciation of the upper half of the body. The next obvious feature is the apparently swollen belly. The belly is not, however, swollen, but assumes an unnatural prominence from the fact that the antero-posterior curvature of the vertebral column is much exaggerated and the shoulders are thrown back.

The walking is peculiar, being as it were on tiptoe, the heels not being placed on the ground. Waddling results, and the effort of walking soon fatigues. A child affected with this disease is easily knocked over. When sitting he can recover the erect posture with comparative ease. The electro-contraction of the muscles is unimpaired, but there is a deficiency of mental power.

In the later stages of the disease walking is impossible and the child lies still, dying sometimes from exhaustion or from intercurrent disease.

Duration.—The average length of the disease is five or six years.

Prognosis.—The prognosis is essentially unfavourable.

Treatment.—In the early stage Duchenne recommends faradization and shampooing. General tonic treatment is beneficial, but there is no medicine at present recognised as having any power to arrest the disease.

WRITER'S CRAMP (*synonym*—Scrivener's Palsy) is a form of nervous disorder attacking those who are engaged in writing a great deal. It is first attended with fatigue and inability to hold the pen firmly, and ultimately, if it progresses, with spasmodic irregular movements of the fingers and thumb when any attempt at writing is made.

Half-measures are of little avail in writer's cramp, and complete abstinence from work is necessary to restore nervous vigour. Recent results by manipulation, rubbing, etc., are to a certain extent satisfactory.

WRY NECK (*synonym* — Torticollis; *tortum*, twisted, and *collum*, the neck). This condition may be congenital or acquired.

CONGENITAL wry-neck arises from faulty development of the muscles on one side of the neck, or from paralysis of the muscles on one side due to accidental injury at birth. In these cases the head is permanently fixed in a twisted condition.

ACQUIRED wry-neck may be due to chronic rheumatism or the result of "lying on the wrong side" during sleep.

A form of acquired wry-neck, termed "**SPASMODIC**," appears at middle life in persons otherwise healthy. The muscle chiefly affected is the sterno-cleidomastoid, and the spasm is usually clonic in character. The result of the recurring contractions is to turn the head away from the side which is the seat of spasm, drawing the occiput a little downwards and the chin slightly upwards. At first the affection is not much noticed, but in advanced cases the suffering is intense and renders life a burden. It ceases during sleep, but it is aroused by the presence of strangers, and in this peculiarity seems allied to stammering.

The pathology of the **SPASMODIC** variety is not well understood. It depends probably on an irritable condition of the spinal accessory nerve, but in what way this is brought about it is impossible to explain.

The prognosis is bad. Recovery from the disease, when it has been well established, seldom takes place.

Treatment.—Tenotomy has been attempted for the purpose of rectifying contraction, or a faulty development of the muscles, producing the torticollis. The benefit derived from this is doubtful.

Large doses of *succus conii* (3i or more) have been given with success by Dr. Harley.

The continuous current has also been beneficial, combined with the rhythmical exercise of the affected muscle. The positive pole is placed behind the ear, the negative pole applied over the sterno-mastoid and

trapezius, and, at the same time, the patient is made to exercise these muscles by shrugging his shoulders and twisting his head.

MERCURIAL PALSY or TREMOR is caused by long-continued exposure to the fumes of mercury, and is characterised by tremors and jerkings of the voluntary muscles, beginning in the arms but extending sometimes to the legs, tongue, and jaws. These movements are increased by the mind being brought to bear upon them or by attempts at exertion.

Permanent bad health is often the result.

Treatment.—This consists in withdrawing patient from the impure air to a fresh atmosphere, and giving iodide of potassium.

APHASIA.

By aphasia is meant not merely loss of voice or aphonia, proceeding from the larynx; not merely impairment of articulation, as at the onset of hemiplegia, from paralysis of the muscles employed in speaking; but an impairment or loss of the intellectual, as distinguished from the mechanical, element of speech. It is an attack on that peculiar gift of man—articulate speech—the power by which he expresses his ideas, and clothes them in words.

Although it is most frequently a combination of loss of power of speech, loss or impairment of the power of writing, and of gestures (pantomimic gestures), yet in its simplest form it appears to be a sudden rupture between the formation of the idea in the mind and the expression of it in words, without being necessarily accompanied by any loss of muscular power. The intellectual chain of thought and speech seems to be broken. Hence the division into—1, *Amnesic aphasia* (forgetting or confusing words); and, 2, *Ataxic aphasia* (defective action of the muscles of articulation—inability to form even those words which are remembered).

“Dysarthria” is a term applied to disturbance of speech from defects of articulation.

"Dyslalia" designates that form of defective articulation which is dependent on gross mechanical defects in the external apparatus of speech.

"Dysphasia" implies disturbance rather than loss of diction.

"Agraphia" is amnesia of the co-ordinated movements necessary for writing, the power of speech remaining. It frequently passes unnoticed owing to the co-existence of right hemiplegia.

These divisions, though retained by some physicians of our country, are abolished by Continental authorities, notably the distinguished French writer Bernard. He summarises these conclusions, and considers that aphasia in its broad sense covers all the features of the affections which may be defined "as the loss of languages due to cerebral defects."

Etiology.—The cause of aphasia is obscure. It may occur during convalescence from fever, and is temporary, or from cerebral softening or hæmorrhage, and is then often permanent.

Symptoms.—The patient has plenty of words sometimes at his disposal, but not the right ones. Speech is then conducted in a Malaprop fashion, or questions are simply answered in monosyllables, as by yes or no. The face is intelligent. Remembering facts and events, the patient is unable, either by writing or speaking, to find words to express ideas concerning them. Nouns are substituted for nouns, verbs for verbs, numerals for numerals, and proper names for proper names. Examples are given where patients forget their own names, or at least are unable to express them. Yet an aphasic patient may be able to play at cards correctly, and even to read, without, however, being able to recollect what has been read. A most curious phase of this affection is when a person forgets entirely some one or more languages that he has been in the habit of using, but retains the power of conversing in another language, which, it may be, he has had no occasion to use for many years past. Possibly this may be accounted for by the fact that the language remembered was learned at a

different time from the others, perhaps at an early period of the patient's life. Consequently the memory of it may have been retained by cells, not in immediate proximity to those harbouring the other languages since acquired, the function of the latter having been alone abrogated by the malady under which the patient is labouring. Though attacks of temporary aphasia are recovered from perfectly, yet, if they are in any way permanent, the prognosis is very doubtful.

Pathology.—Aphasia is most commonly associated with hemiplegia of the right side, and M. Broca has attempted to prove that this is due to the fact that the power of language is situated in the posterior portion of the third left frontal convolution of the brain. This view has received some confirmation from post-mortem and clinical observations, as this portion of the brain may, through an embolus plugging up the middle cerebral artery, become imperfectly nourished and consequently softened and degenerated. Ingenious theories have been founded on this supposition, the most practical result being, if it is true, that on the right side the same part has also latent power of language, and that we should not despair, but that this may, in the course of time, be evoked, and a moderately intelligent life be the result.

Treatment.—Rest, bodily and mental, is all we can do for an aphasic patient. All excitement should be avoided, the bowels attended to, and the digestion carefully regulated. Sexual intercourse and alcoholic indulgence should be specially shunned.

Blistering or drugging seems of little avail in aphasia with hemiplegia. Yet, if there is any syphilitic history, iodide of potassium should be given. In slight cases of aphasia special advantage seems obtained by the use of phosphorated oil and the hypophosphites of lime and soda.

NEURALGIA.

Under this head should be included affections which, so far as can be ascertained, are not due to diseases of

the brain or spinal cord, but the seat of which is in the nerves themselves.

Different names are given, according to the site of the nerves affected. Thus we have facial neuralgia or tic douloureux, sciatica, and lumbago.

FACIAL NEURALGIA (*synonym*—Tic Douloureux) is more apt to attack females than males during adult life, and seems often to have some connection with menstruation, lactation, mental excitement, or exposure to cold. The pain is frequently excruciating, coming on and disappearing at fixed hours of the day. It may attack the nerve in any or all of its divisions.

SCIATICA.—The pain is referred to the course of the sciatic nerve or its branches, and may be restricted to the gluteal region or upper part of the thigh, or it may extend to the soles of the feet. It generally lasts from two to three months, but is apt to recur. It is often associated with a lowered physical stamina, and sometimes there is a previous history of gout, rheumatism, or syphilis.

LUMBAGO and PLEURODYNIA.—The dorsal and intercostal nerves are here the seat of pain, which is continuous in character and much increased by exertion. The mere act of straightening the back in lumbago often causes great agony.

Treatment.—In facial neuralgia quinine and arsenic are efficacious, with the addition of colchicum if there is a history of gout; or alkalies, if rheumatism. To arrest the paroxysms morphia may be subcutaneously injected, or a combination of lin. opii, lin. belladonnæ, and lin. chloroformi may be used (F. 57*h*). Butyl-chloral hydrate, in five-grain doses thrice daily, will alleviate or give entire freedom from neuralgic pains connected with the head, but its effects are only temporary, as it in no way acts as a tonic. Hence a fresh pure air is indispensable to any treatment. Cod-liver oil, iron, and strychnia, are often useful (F. 4, 75, 78).

In sciatica the injectio morphinæ hypodermica into the

tissue of the nerve daily, or as near to it as possible, seems not only palliative, but even curative. Among other remedies which may be mentioned, stand strychnia, phosphorus, and iron, acupuncture, repeated blisters, Turkish baths, or the local application of unguent. aconitinæ or unguent. veratrinx. Turpentine internally, either in the form of the oil or confection, has long had a deserved reputation with well-known authorities, and may be adopted, with this proviso, that if good is not done by its use in eight or ten days it should not be continued. For this purpose 120 minims of the oil of turpentine may be mixed with an ounce of honey, and a teaspoonful taken morning and evening. The following conditions, favourable or unfavourable to its employment, are noted.

1. There must be no alteration of the nerve-structure.
2. The sciatica must not be due to any tumour pressing on the nerve.
3. There is most chance of success when the neuralgic character of the sciatica is well marked, and when the pains are very acute. In the more chronic cases, iodide of potassium has met with considerable favour; and, if prescribed, it should be given in large doses, from 15 to 120 grains in the course of the day. In sciatica small doses are therapeutically valueless. The induced current, continued for half-an-hour, is sometimes singularly beneficial in this as in the other forms of neuralgia (F. 63). After other means have failed, I have seen marked benefit follow hot and cold douches played alternately over the course of the nerve.

VERTIGO.

Variety—Auditory.

Synonym—Menière's Disease.

By Menière's disease is meant a group of phenomena, to which attention was first directed by Menière in 1861, including sudden giddiness, staggering gait or tendency to fall on one side, vomiting, noises in the ear, and deafness on one or both sides—symptoms simulating intracranial disease. The deafness and noises in the ear

usually remain permanent, while the other symptoms pass off for a time, generally to recur again, the deafness being more complete after each recurrence. On account of the giddiness and the tendency to fall to one side, Menière believed that the cause of the phenomena in this disease was some morbid change in the semicircular canals. He based this explanation on the well-known experiments of Flourens, which pointed to that part of the inner ear as the organ which controls the equilibrium of the body. Menière's disease is sometimes designated "labyrinthine vertigo," from the supposed seat of the symptoms. It has, however, been pointed out by aural surgeons, such as the famous Von Tröltsch, that the phenomena of this disease may arise from morbid conditions in the external auditory canal and the middle ear, especially from any pathological condition which leads to abnormal pressure on the labyrinthine fluid, such as undue pressure of the stapes on the membrane which closes in the *fenestra ovalis*. It is very probable, however, that the phenomena of Menière's disease are sometimes due to a sudden change in the condition of the parts contained in the semicircular canals.

If the seat of the symptoms is not in the peripheral parts of the ear, the treatment is usually very unsatisfactory. Large doses of bromide of potassium have been recommended and should be tried. Gowans has used salicylate of sodium and gelsemium with good results.

MEGRIM.

Synonym—Paroxysmal Sick-Headache.

In the course of various diseases, headache forms a prominent symptom, as in the commencement of all fevers. It is attendant on various nervous disorders (of more or less grave character), and it is also associated with gastro-hepatic derangements and diseases of the kidney and circulatory system. Congestive headaches are aggravated by the recumbent position; cerebral anæmic headaches are relieved by lying down. Head-

aches due to cerebral structural disease of the brain may be detected by the ophthalmoscope revealing well-marked neuritis (papillitis). If the pain is in the forehead, Dr. Hughlings Jackson says it is most probably due to abdominal affections; if at the vertex, to cerebral disturbance; if at the back, to disorders of the circulation, and more especially to anæmia; if fixed, intense, localised, and attended with tenderness of the scalp, a cerebral tumour may be suspected.

In the affection called Hemicrania or Migraine, the pain is on one side and fixed to one spot, as the temples, although it may commence as a dull pain over the forehead. The pain is more dull and sickening than neuralgia, and its great peculiarity is the throbbing which occurs with every beat of the heart, and is aggravated by every movement of the body, especially of the head. The great desire of the sufferer is to be let alone and not be spoken to. Sometimes, even lying down is out of the question, and the patient can only obtain comparative ease by sitting in an easy-chair. The body is cold, but the head is hot; and, whilst the radial artery feels small, the carotid is full. In this distended throbbing carotid, and its influence on the cerebral circulation, it is supposed lies the source of the malady, and this again seems dependent on paralysis of the vaso-motor nerves of the same side.

The duration of a bad attack is usually several hours. It is often hereditary. It rarely commences after thirty, and subsides with advance of years. Females are more prone to it than males.

Treatment.—The patient should be kept in a darkened room and afforded complete rest during the paroxysm. A teaspoonful of tincture of guarana, given immediately before the attack, is specially recommended. Strong tea or coffee also sometimes gives relief, and pressure on the carotid or temporal artery of the same side may soothe the headache.

As prophylactic measures, mental or bodily worry should be avoided, and gastric derangement obviated.

EPILEPSY OR FALLING SICKNESS,

sometimes also popularly termed "fits."

No definition can be given of epilepsy, because no definition would embrace all its phenomena. Yet it may be stated generally to be a disease characterised by certain leading features, viz. sudden loss of consciousness and sensation with clonic spasms of the voluntary muscles, usually followed by exhaustion and coma. The essential element of epileptic paroxysms is loss of consciousness.

Etiology.—The tendency to epilepsy is often hereditary, but various other causes may be mentioned. Occurring often at puberty, it is justly considered in many cases to be a lamentable corollary of masturbation, of too early and frequent sexual intercourse, of malformations of the head, of the scrofulous diathesis, or it may be the direct result, either to himself or children, of an habitual drunkard's habits.

These are centric causes; while, as eccentric sympathetic causes, may be mentioned uterine derangements, irritation of teething, and a disordered state of the stomach and intestines. Fright is a prominent exciting cause in a person predisposed to epilepsy. The first seizure occurs usually betwixt the tenth and twentieth years.

Symptoms.—These are best divided into what occurs before, during, and after a fit.

Warnings of various kinds may precede the attack. Spectral illusions, confusion of thought or speech, headache, dimness of vision, or what the patient describes as the indescribable sensation of an inward working. The most curious forerunner of a fit is what is termed the "epileptic aura or vapour." It seems to come from some distant part of the body, and patients describe it creeping along, as water may trickle or a serpent crawl, until it reaches the head or stomach, when consciousness is lost in the fit; or in contradistinction to this sensory aura

there may be what is termed a "motor aura," recognised by twitching or palsy of some part of the body.

With or without these precursors, the fit is ushered in by a shrill cry and the patient falls down unconscious, struggling hard in convulsions. Unable to select a convenient place, the patient may fall in such a way as to hurt himself seriously. He gnashes his teeth, pushes out and often bites his tongue, foam gathers at his mouth, the forehead and eyebrows twitch, the eyes are partly open and partly shut, and the pupils are insensible to light and dilated.

The body writhes in convulsions, or is jerked from side to side, and what is popularly thought to be characteristic of the disease may be observed, viz. "the flexing of the fingers, and more especially the flexing of the thumb into the palm of the hand." The urine and fæces are often passed involuntarily; and, in the male, a seminal emission may take place. The fierceness and alarming nature of the attack render minutes hours to the bystanders, as a fit averages only five to eight minutes in its duration, although it may last half-an-hour or more.

After perhaps a more sharp convulsive movement, there is deep sleep, from which the patient awakens with utter unconsciousness of what has occurred, with headache, red eyes, dilated pupils, and a peculiarly stupid expression of countenance. This is succeeded by seemingly restored health, but ultimately by other seizures, the interval between the occurrence of which varies. Usually an interval of four or five weeks elapses, and this is followed by a series of fits, occurring at short intervals. Although epileptic attacks are not primarily fatal, yet gradually the constitution is sapped, the mental and bodily vigour impaired, and not unfrequently the unhappy victim of epilepsy ends his days in an asylum. Such is a description of what is termed the "Grand Mal," and from which a sliding scale can be traced to what is known as the "Petit Mal." Here, unconsciousness may be as complete as in the severer forms, but the fits may last only a second or two, as, for instance, the case of a person stopping in

the middle of a conversation for a few moments to resume talking where he left off, quite unconscious of the fit.

Pathology.—Should death occur during a paroxysm, the brain is found more or less congested, while, in long-standing cases, it may be softened or indurated and increased in weight. The researches of Schroeder van der Kolk point to the medulla oblongata as the seat of the disease, which is supposed to be more excitable and sensitive, from an increased afflux of arterial blood, or from the accumulation in the system of some *materies morbi*, which leads to an explosion in the form of an epileptic fit. Hughlings Jackson and Ferrier have produced epileptiform fits in animals by galvanic stimulation of certain convolutions of the brain, which, if removed, do not cause paralysis, but yet, when stimulated, give rise to these convulsions. Hence, epilepsy seems to be an explosive lesion, like the discharge of a battery, although we cannot say that an excess of energy is manifested, for we must take into account the energy required for constraint, which is taken away, and thus all energy is concentrated in the abnormal convulsion.

Brown-Séquard thinks that epilepsy is due to irritation of nerve-cells, which have their nutrition altered, and after a time acquire that morbid excitability which is the essence of the disease. He does not consider that it will ever be possible to recognise what cells are altered, as it is quite likely the change in them is more dynamical than physical. "That, however, the cells are located chiefly in the base of the brain," he considers, "is a conclusion borne out by many facts." At the same time he admits "that the spinal cord has a share in the production of epileptiform convulsions, and may help in producing in man an arrest of cerebral activity during a fit of epilepsy."

Treatment.—This consists of two points:—

1st, What to do during a convulsion, and 2d, after a convulsion.

1. When the fit occurs, the head of the patient should be placed in such a position that the tongue, which is

then paralysed, should not fall back on the larynx and cover its aperture. Certain obvious duties are also necessary. The necktie should be loosened and the patient placed in such a position, with the head somewhat elevated, as to prevent his injuring himself during the struggle against articles of furniture. If it is possible, a piece of wood or india-rubber should be placed between the teeth, in order that the tongue may not be bitten. It is unnecessary to do more than what has been mentioned. Active measures do harm; the fit when begun cannot be successfully shortened, and it is thus better to wait until nature in due time recalls the patient to consciousness. It has been asserted that nitrite of amyl capsules broken and inhaled may avert an attack, and it is known that chloroform may stop it when it has occurred; but, if this is administered, the patient is left more stupid and afflicted than if the natural outburst had been allowed to take place.

2. It is impossible to get rid of certain predispositions, such as a strumous diathesis, a misshapen head, or organic lesion of the brain and spinal cord. At the same time, some eccentric causes are remediable. If due to worms, give a vermifuge. If a syphilitic history exists, iodide of potassium and the bichloride of mercury are serviceable. If dependent on vicious habits, the patient must be warned against these. The system should also be braced up by good air, cheerful society, and the shower-bath, the latter being used only if it produce a genial glow of warmth.

There seems to be a consensus of opinion as to the benefit to be derived from the use of the bromide of potassium. Some prefer to give the drug alone, but others consider it better to combine it with bromide of ammonium or sodium (F. 69, 70a), or with bromide of ammonium, iodide of potassium, and tincture of calumba (F. 71b). The latter combination is supported by the high authority of Brown-Séquard, who states "that the combination of bromides has far greater power than when either one is used alone." This treatment may be supple-

mented by counter-irritants, in the form of a blister at the spot where the AURA originates. If this is at the finger, then apply a circular blister in the form of a ligature to the finger itself. In carrying out the bromide treatment of epilepsy it is essential to act in no haphazard manner, but with an assured trust in its efficacy on the part of the practitioner, for this engenders corresponding and sympathetic hopefulness in the patient. Certain conditions are associated with its successful administration. The bromide of potassium, if taken alone, should be given to the extent of forty-five to eighty grains daily; if in combination with the bromide of ammonium in three-grain doses, a smaller proportion is requisite, as thirty grains daily. The drug, according to Brown-Séquard, should be pushed to produce an evident, though not complete, anæsthesia of the fauces and upper parts of the larynx and pharynx. Sleepiness during the day, occasioned by its use, may be avoided by giving a small dose before meals and a full dose at bedtime. The acne eruption of the face, neck, and shoulders should be produced, and if there should be no eruption within a few weeks of its administration, the dose should be increased, and also when the eruption is disappearing, unless there should be a decided daily sleepiness and signs of mental and bodily weakness. This production of the acne eruption has the sanction of Brown-Séquard; but it is to be observed that many English specialists do not consider it necessary. All, however, agree that the remedy should never be omitted to be taken until there has been fifteen to sixteen months' freedom from attacks of epilepsy. In cases where there is much debility, a nourishing diet with the use of liq. strychninæ hydrochloratis or liq. arsenicalis, preferably the former, should be recommended.

A gentle purge, as pulv. rhei co., every four weeks, gives a new impetus to the usefulness of the bromide treatment. Other internal remedies are employed in epilepsy, notably strychnia in $\frac{1}{12}$ -grain doses twice daily; oxide of zinc thrice daily in pilular form with extract.

glycyrrhizæ, in 2-grain doses at first, but increased to 15—the treatment to be continued from three to six months; or *R. zinci valerianatis* gr. iii.; extract. belladonnæ gr. $\frac{1}{8}$; pulv. digitalis gr. $\frac{1}{4}$. *M.*—one pill thrice daily when epilepsy is associated with irregularity of the heart's action.

Of external remedies are specially to be noted, in addition to the blister of Brown-Séquard, and the cold shower-baths already spoken of, dry cupping, the actual cautery to produce a white line, and anæsthetising the terminal nerve-fibres from whence the aura originates; or a seton, made of sixteen strands of silk or flax thread, should be placed in the neck, and retained if necessary for a month.

If epilepsy is other than idiopathic, as previously mentioned, remedies are of little avail.

CHOREA (*Synonym*—St. Vitus's Dance)

literally means a dancing or jumping, being derived from the Greek word *χορεία*. It is the "Saint Vitus's dance" of this country, the "Veitstanz" of Germany, and "Saint Guy" of France. It may be defined as a disease most commonly affecting girls between the sixth and the sixteenth years, and characterised by irregular action and restlessness of the voluntary muscles of the face and limbs. It sometimes attacks boys. As a rule it is confined, in either sex, to the left side.

Etiology.—The exciting cause is usually fright, by which the stability of the nervous system is disturbed. Sometimes it is due to worms and to carious teeth; and, as it is often associated with a previous history of rheumatism and with a systolic murmur at the apex of the heart, it is by many considered due to this disease, or to embolism in some part of the cerebral circulation. More recent information with regard to chorea, based on the researches of Dr. Dickinson, shows that the clinical phenomena of chorea cannot be referred to any circumscribed region of the nervous centres, for they affect so many

different functions of the body, and seem to be connected at the same time, or successively, and in different degrees, with the cerebral convolutions, the ganglia at the base, the medulla, and the spinal cord. On the basis of post-mortem facts, he thinks that chorea depends on a "widespread hyperæmia of the nervous centres, produced by causes mainly of two kinds, one being the rheumatic condition, the other comprising various forms of irritation, mental and reflex, belonging chiefly to the nervous system." The general health is usually "below par" at the time of the attack.

Symptoms.—Twitching of the muscles of the face is generally first observed. This is followed by a halting or unsteady movement of the leg, which the patient drags. Then the hand of the same side is affected, and the patient is unable to keep it in the same position for any length of time. It is jerked away from any position in which it is placed, and it is unable to retain anything within its grasp. The patient has power, but not control. The articulation is impeded, and in severe cases the tongue, when protruded, is drawn back again with a sudden snap; but consciousness is not affected. Looking at, or drawing attention to, the patient increases the irregular movements. It may be unilateral or bilateral,—in the former case being called Hemichorea. During sleep the movements usually cease.

Hemianæsthesia almost always accompanies hemichorea.

The duration of the disease may be stated to be from five to six weeks, although it sometimes becomes chronic and lasts several months. The disease seldom terminates fatally, except when, as rarely happens, it is very acute and complicated with other affections, as cholera or acute rheumatism. In such cases it is attended with fever, the spasms being of excessive intensity, not painful, but still prohibiting sleep and thus exhausting the system.

Pathology.—The post-mortem appearances do not indicate any localisation of the morbid change in the central ganglia. What the precise anatomical condition

may be in chorea is therefore a matter of conjecture, but it is most likely due to some form of mal-nutrition, irritability, and debility. Hyperæmia, or capillary thrombosis, or embolism, have been suggested as likely causes; so also is prolonged arterial spasm from persistent reflex irritation, uterine or intestinal. The occurrence—almost always noted—of fright preceding chorea may produce a brief contraction of the cerebral vessels, which, however, may be powerful enough to lower the functional vigour of the ganglia to the degree required to originate chorea. Its occurrence, moreover, in early years is coincident with the unstable and special activity of the sensori-motor ganglia known to exist at that epoch of life.

Treatment.—After a brisk cathartic, combined, if there is any suspicion of worms, with an anthelmintic, the patient should have a carefully-regulated, easily-digested diet; and, if unable to feed herself, should be assisted to do so.

Various remedies have been recommended, as steel, oxide of zinc, sulphate of copper, nitrate of silver, bromide of potassium, and chloral. None of these has been in my hands nearly so useful as arsenic, given in the form of liq. arsenicalis thrice daily (F. 4). This remedy should be continued until its physiological action is manifested, which generally occurs at the end of the fourth week of administration, and is attended by itching and redness of the conjunctiva and dryness of the mouth. The medicine is now stopped, and is resumed after a week or ten days in one-minim doses thrice daily. If there is much anæmia, tinct. ferri perchlor. in six-minim doses should be given with the arsenic.

In the very acute cases, where a fatal issue may be feared from sheer exhaustion, it would be proper to keep the patient under the influence of chloroform for protracted periods.

ATHETOSIS (*ἄθετος*, without fixed position).

Here it may not be inappropriate to note a condition,

allied somewhat to chorea and characterised by inability to retain the fingers and toes in any position in which they may be placed. Their continual motion has given rise to the definition mentioned by Dr. Hammond of New York. The special characteristic of the movements in athetosis is their slow and deliberate nature, thus differing from the spastic contraction observed after hemiplegia in children. The onset of the condition is usually sudden, and the persons attacked have been generally in middle life.

Treatment.—Arsenic and conium are the remedies indicated. The continuous current is the agent which affords most relief, and sometimes effects a positive cure.

AGORAPHOBIA (*ἀγορά*, a market-place; *φόβος*, fear).

The French synonym, “La peur des espaces,” well illustrates this peculiar nervous condition, which is characterised by terror when the individuals attacked are in a certain space, as the street, public buildings, a bridge, or in looking over a precipice. Consciousness is not impaired, there is no true vertigo, but merely intense fright, accompanied by violent palpitation of the heart and coldness of the extremities.

Agoraphobia occurs in males and females especially of a nervous temperament; and in some instances there is a history of hereditary insanity or epilepsy.

Treatment.—The condition is often improved by the agoraphobic person walking with an intimate friend and braving the danger. Familiarity with space and crowds, when known help is near, may assist to banish all uncomfortable sensations when alone.

HYSTERIA.

This term is misleading, being derived from *ὑστέρα*, the womb, and indicating that the womb is primarily affected, and that the male sex is exempt from its influence. We know that these conditions are not absolute, for the womb

is not necessarily in a morbid condition, and the male sex is subject, though only exceptionally, to hysteria. The term hysteria must, however, be retained, as it is identified with the literature of medicine, and it would be difficult to find any name which would exactly include the phenomena of the disease subsequently to be mentioned.

In hysteria there appears to be no definite alteration of structure in the nervous system, though this is simulated in many instances. It would appear that partial or complete suspension of the inhibitory influence is the main fact in the symptoms of hysteria, mental and physical. A laugh in a condition of health goes no farther than the will can control it, but in hysterical people a laugh may end in tears or shouts, or even in spasms and convulsions. It ripples into other nervous centres which are normally exempt from its exciting influence.

Hysterical paralysis indicates that the power of the higher centres in originating movement is in abeyance. Hysterical anæsthesia is due to lack of feeling or sensory impression, and hysterical hyperæsthesia and pain seem to be initiated in the fact that the sensory ganglia are not, as in ordinary states, dependent on the peripheral nerves.

Etiology.—The female is more prone to hysteria than the male, and there is some ground for believing that hereditary predisposition exists in many cases.

Hysteria usually occurs between fifteen and thirty—most frequently between fifteen and twenty. Often luxury, enforced chastity with prurient desires and thoughts engendered by light reading, unnatural desires, and unfortunate marriages, seem to evoke hysterical symptoms. Want of sleep from prolonged nursing of a sick relative is often a prominent factor. Hysterical symptoms seem to reach their acme, as in neuralgia and epilepsy, when the menstrual period approaches.

Symptoms.—The symptoms of hysteria may be grouped under (1) mental, (2) sensory, (3) motor, (4) circulatory, (5) visceral.

Mental.—There may be apparently increased mental

power, but, if so, it lacks the firm control usually associated with higher cerebral development. The emotions predominating are often of an incongruous and ludicrous character. A pathetic story may evoke laughter; a ridiculous and amusing anecdote may cause tears. Common sense and prudence are absent, and an intense longing for the sympathy of others is a pronounced phenomenon. Unfortunately, there is often a mental twist which leads to deception and untruthfulness.

Sensory.—Hysterical pain and tenderness are seen in different situations of the body. It may simulate intercostal neuralgia, usually of the left side. It may appear to be a serious spinal disease affecting the cervical and upper dorsal region. It may settle in a joint, as the knee, and produce manifest and excruciating agony, resembling acute synovitis. It may reside in the mamma, and have the darting symptoms of cancer. It may attack the head, and excite suspicion of a cerebral tumour.

Epigastric and iliac tenderness are prominent phenomena in hysterical patients, while anæsthesia rarely affects the whole body. It usually is limited to one side, generally the left. This anæsthesia may be confined to the surface, or it may be deep-seated, and pain is not experienced when pins are driven into the muscles.

The disorders of sensation in hysteria may, broadly speaking, be distinguished from organic disease by the fact that they are unstable, their appearance and departure depending on no fixed rule, and that they are apt to ensue on some worry or moral shock.

Motor.—Spasm, convulsion, and paralysis are the chief motor phenomena. The globus hystericus is perhaps the most constant sign of the disease. This feeling is described by hysterical patients as akin to choking, and is likened to an egg filling up the throat. It is often followed by a burst of tears.

Spasms affect various muscles connected with respiration. A cough, sharp and ringing, unaccompanied by expectoration, is seen to be developed when the patient is not alone, and when sympathy with her condition may

be manifested. The expiratory spasm may be evinced by laughing and crying, or by yawning, hiccup, and sneezing.

Spasms, clonic and tonic, of limbs may occur, and may sometimes resist even the inhalation of chloroform. But faradisation, continued for some minutes, settles all doubts if applied to an hysterical contraction or a phantom tumour, for this exhausts muscular contractility, and, *nolens volens*, the ailment is cured.

Convulsive seizures are frequent, and simulate epileptic fits. It will be noticed, however, that the face in hysteria is more or less red, that the fall is always chosen so as to avoid positions of danger, and that the cry is not a "wailing shriek" like that of epilepsy, but a confused medley of choking, with much gesticulation. The tongue also is not bitten, and the deep sleep of epilepsy does not supervene on the attack, for the hysterical patient may in a few seconds recur to her former condition.

There is no incontinence of urine during a fit of a hysteroid character, though there may be a copious flow of clear urine at the termination of the seizure.

Paralysis may affect any limb, but as a rule paraplegia is the usual form. The muscles retain their nutrition, and in most of the cases there is no history of antecedent convulsions. The irritability to induced currents is also normal, although there may be at first an apparent slight loss.

Circulatory.—Syncope may develop and simulate death, for occasionally the pulse is imperceptible, the patient being speechless and apparently unconscious. Recovery, aided by the inhalation of ammonia, occurs, accompanied by profound sighing.

Visceral.—Vomiting is a frequent symptom, and may last for some months, without, however, any great loss of weight or sensible mal-nutrition. Noisy flatulence in the intestines is common, and retention of urine may be observed, or there may be an undue desire to empty the bladder regardless of appearances or proprieties.

Prognosis.—The prognosis, so far as life is concerned,

is always favourable, but the disease, if maltreated by too much sympathy and attention, may last for a length of time. As a rule, with some few exceptions, the hysterical phenomena, of whatever type, cease with the end of the climacteric period.

Treatment.—The patient's surroundings must be carefully considered when the disease is fully diagnosed, and the removal from home and a residence among strangers are always attended with benefit. Certain medicinal agents have undoubted value.

Thus, the inhalation of ammonia is a well-known and worthy remedy. Valerian in powder or tincture has a manifest effect, and the aloes and asafœtida pill (B. P.) has an established reputation. In hysteria with anæmia, iron is indicated, and the dialysed preparation is preferred as causing less disorder of the digestive powers.

Strong induced currents are useful in anæsthesia and paralysis, and there can be little doubt that hysterical convulsions are effectively mastered by douching the patient with cold water. For a few seconds the water may seem to have no effect, but this condition is invariably succeeded by gasping, and the patient's movements or words indicate she does not desire to have the experiment continued. In many cases the remembrance of the treatment may prevent a repetition of the convulsions. The douche seems to act by the medium of the cutaneous nerves, and, by its action upon the ganglionic nerve-cells, to change the character of the blood-circulation.

Charcot recommends moral treatment in the form of isolation. Young persons, whether male or female, should be separated from their parents, and placed under the care of experienced and firm nurses, and only at occasional intervals (when amendment is progressing) should they be allowed to see friends for a short time as a reward for good conduct. Time and hydro-therapeutics do the rest.

CATALEPSY (κατάληψις, a seizure).

Catalepsy is a disease of the nervous system of a peculiar character. The attacks render the patient powerless, as a rule with loss of consciousness, and accompanied by a remarkable form of muscular rigidity, in which the limbs remain for a time in any position in which they are placed.

The disease may occur at any age in either sex, but it is much more common in females than males at the age of puberty. It is generally associated with some form of hysteria, and may be often looked upon as a prolonged and peculiar form of an hysterical paroxysm. Nervous exhaustion seems to be the chief cause of catalepsy; the nervous system becomes weakened, and some slight excitement, emotional or religious, may evoke the symptoms of the disease.

Symptoms.—Preceded, it may be, by headache and giddiness, or by no direct warning, the attack suddenly deprives the patient of consciousness. The whole muscular system is rigid and remains for a time as if petrified, resisting movement. Afterwards, at a varying interval of minutes, the muscles become plastic and wax-like, retaining the position they are placed in; hence the term “*flexibilitas cerea*.” The face has no expression, the temperature is lowered, and the respiratory and cardiac systems decidedly weakened.

In profound cases, the patient cannot be awakened by touch, pain, nor electricity; in less severe cases, partial sensibility remains and reflex movements can be produced. The attack may last a few minutes or hours, and the recovery may be sudden or gradual.

In whatever way the attack may commence, the result usually is that inability to speak remains for some time.

Much speculation and little definite knowledge have been the result of observation and reasoning on cases of catalepsy, and all that can be safely said is that it seems a midway station between epilepsy and hysteria.

The prognosis is favourable.

Treatment.—Attempts may be made by external stimulation to rouse consciousness, and, for this purpose, ammonia may be applied to the nostrils and sinapisms to the limbs. These stimulants generally fail, but often a pinch of snuff may restore sensibility; if it does not, faradisation may be tried, which usually succeeds. In very obstinate cases apomorphia in $\frac{1}{15}$ of a grain dose may be injected, and the vomiting induced may terminate the attack. During the intervals, iron, antispasmodics, and cold baths should be trusted to, and the patient should be removed from all local influences which seem to favour the attack. Hence a change of air and scene is an almost absolute necessity.

DISORDERS OF SLEEP.

The amount of sleep varies at different ages, as the following table shows:—

Up to 10 years, children usually sleep for 14 or at least 12 hours.

From 10 to 15 the duration of sleep varies from 10 to 12 hours.

„ 15 to 25 it should not be below 8 hours.

„ 25 to 50 it may fall to 7 „

After 50 the sleep varies from 7 to 6 „

Sleep may be neither excessive nor defective, but wakefulness, if prolonged, may end in a grave condition—insomnia. This condition is associated frequently with great grief, mental anxiety, overwork, or it may be the result of excessive pain or the abuse of alcohol.

Byron stated that healthy sleep consisted in being lulled by the waves of the ocean, and awakened by the songs of birds. This Utopia cannot be attained, for in this busy age, with much bustle and worry, sleeplessness is often a marked symptom, either in males or females, at the ages of forty to fifty. In the former it may lead to insomnia, in the latter to a restless, fidgety state, which prevents all natural repose.

Treatment.—The treatment of sleeplessness requires

firmness and tact. It is essential that the digestion should be in perfect working order—food being taken at regular hours, with the action of the bowels solicited at a time fixed every morning, before or after breakfast. On rising, the feet should be placed in warm water and the body thoroughly sponged with cold water. If the reaction is healthy, a shower-bath should be taken. Exercise is of paramount importance; in the case of a man, it should average ten miles a day, in a female, at least six miles. On going to bed, the feet should be bathed in cold water and dried thoroughly with a rough towel until they are warm and red. No one can possibly sleep with cold feet. The head should rest on raised pillows, and immediately before or after entering the bed some beef-tea, gruel, or oatmeal porridge, may be taken. A walk of one or two miles, preferably against a wind or up a hill, before retiring, is, in the case of males, often attended with excellent results. When in bed, by the light of a candle, the *Times* newspaper, or some interesting book, may be read, until the letters and sentences become confusing, when the candle should be blown out, and sleep wooed. A non-professional friend informs me that for forty years he has systematised the best conditions for sleeping, and these are, in his own words:—

He closes his eyes and breathes very slowly, leaving as long an interval as he can before each inspiration. To keep out every idea that might lead to a train of thought he mentally counts these acts of breathing up to twenty, and then begins again at one, two, etc., till asleep. Sleep comes on in from one minute to five minutes. At the last moment, he sometimes makes a *very* slight change of position, and this is almost always his last conscious act.

The attention to the breathing and the necessity for a slight monotonous effort in counting, produce physiological conditions which favour sleep.

When such measures are unavailing, recourse must be had to hypnotics, and of these the least prejudicial undoubtedly is the bromide of potassium in doses of twenty

to thirty grains. Chloral is a dangerous remedy, and should not be prescribed except under grave emergencies. The dose should never exceed thirty grains. If the bromide fails, opium or morphia must be given. In any case where hypnotics are prescribed, it is essential that the patient should be warned not to continue them, unless under medical restrictions. Occasionally, fifteen drops of tincture of digitalis taken at bedtime may produce the anæmia of the brain required for sleep. There is also little doubt that, for aged persons, whisky and warm¹ water, taken in a small quantity, have an excellent effect.

Ladies troubled with fidgety sensations and sleeplessness are greatly benefited by the mud baths of Franzensbad, in Austria.

SUB-SECTION III.

MENTAL DISEASES.

GENERAL PARALYSIS.

Synonym—General Paresis.

In the course of some forms of mental derangement, a gradually advancing paralysis sooner or later involves nearly every muscle of the body, and hence it is called "general paralysis," or familiarly, "G. P."

Those attacked are most frequently males between thirty and fifty years of age. The causes are obscure. Some assert the disease is due to mental overwork and anxiety, to venereal or alcoholic excesses, or to a sudden and unexpected strain on the mental organisation. Grave warnings sometimes precede the affection, or the disease may come suddenly on persons who seemed previously to have enjoyed robust health.

¹ Professor Rutherford, if I remember rightly, used to say whisky and cold water, but I should think the first ingredient is the important one.

Anatomical Character.—The pathological changes are differently rendered, the precise nature not yet being definitely settled. The lesions chiefly observed are congestion and thickening of the membranes of the brain, with a fatty or shrunken condition of the nerve-cells and an increase of the connective tissue.

Symptoms.—The symptoms are divided into mental and physical.

1. Mental. Mental symptoms generally precede the physical. The first indications are sleeplessness and restlessness, and an inability to speak, write, read, sing, or fix the attention on any particular subject. This enfeeblement of the mental powers gradually advances, until absolute fatuity results. Before the latter stage is reached there are generally extravagant ideas observed by friends, such as the fancied possession of great wealth, infinite power, or colossal size. Wild schemes are seriously entertained, and hopefulness in a fair and brilliant future, notwithstanding dubious surroundings, is daily intensified.

2. Physical. The physical symptoms are, great fatigue after slight exercise and utter prostration after any unusual exertion. There is a convulsive tremor of the upper lip after any excitement, and a trembling in the tongue when an attempt is made to hold it out. This paralysis of the lips and tongue leads to defective blurred articulation, and the face loses all expression, and assumes a sad or blank look. Tremor of the feet is noted in performing simple actions, such as getting out of cabs or walking down stairs. These symptoms are succeeded by a general and progressive course of the loss of co-ordination. As the disease advances to its almost invariably fatal termination, the physical strength diminishes, and the patient, unable to walk, stand, or sit, is confined to bed for the rest of his existence, death occurring either from the difficult deglutition leading to choking, or from sheer exhaustion or other intercurrent affection. Atrophy of the optic nerve can often be detected by the ophthalmoscope, and it is noticed sometimes at an early stage that

there is an unequal contraction of the pupils, and occasionally a fixed squint.

Prognosis.—The ordinary duration of the disease is from a few months to three years. Complete recovery seldom occurs.

Treatment.—If the disease is detected in its very early stage, the patient should avoid all irritation, abandon if possible his usual business, be much in the open air, and take regular walking exercise every day. Sexual intercourse should be avoided. Light novel reading should be enjoined, and amusement, such as playing at whist, recommended in moderation. Occasionally, by strict observance of the injunctions mentioned, aided by the kindness of friends, the dreaded malady may be averted. When, however, this is not the case, and the malady steadily advances, all that can be done may be accomplished by careful nursing at home, and, if possible, without removal to any asylum.

The other mental diseases are—

Hypochondriasis.

Mania.

Melancholia.

Dementia, including Acquired Imbecility.

Idiocy. (*Synonym*—Congenital Imbecility.)

Puerperal Insanity.

Epileptic Insanity.

Insanity of Puberty.

Climacteric Insanity.

Senile Insanity.

Toxic Insanity, from alcohol, gout, lead, etc.

Traumatic Insanity.

Insanity connected with obvious morbid change or changes in the brain.

Consecutive Insanity, from fevers, visceral inflammations, etc.

The consideration of these various forms of mental diseases is embraced in special works bearing on the subject, and is foreign to the nature of this handbook.

DISEASES OF THE SKIN.

The following questions, if remembered by the student brought face to face with a case of skin disease, will aid him in forming a correct diagnosis. Is the disease inflammatory or non-inflammatory? Is it moist or dry? Is it papular or scaly? Is it a tumour or is it pigmentary? Is it contagious or non-contagious? Is it general or circumscribed? What are the history and the duration of the disease? What has been the treatment, if any, adopted?

I would exclude generally all cutaneous diseases of a rare character, and state emphatically that no student's examination should be conducted on a case which is remarkable simply for its rarity, and which is most unlikely to be met with in this country in general practice, except under most exceptional circumstances.

Acting on this principle, I consider it better when speaking of the individual diseases to place the rarer forms in small print, reserving the common type for those likely to be observed in after years. A broad and appreciable distinction will thus be made; and aid, it is to be hoped, the apprehension of a subject which, from its language and phraseology and generally dislocated state, is always a serious bugbear to neophytes in medicine. A series of questions and explanations will bring out fully what is meant.

What is the essential character of an inflammatory affection of the skin apart from the fever which may or may not accompany it at the moment of observation? It is superficial and red, the eruption not being uniform, but occurring in patches varying in size and severity, and disappearing under pressure. How does it terminate? In resolution, the whole exanthem dying away; or in desquamation, scales having formed where the eruption previously existed. Thus the inflammatory affections of the skin are said to be *exanthemata*, at first consisting of

superficial red patches, which disappear under pressure, and terminate in resolution or desquamation.

Included under this division are the skin diseases *erythema*, *urticaria*, *roseola*, and general diseases having skin eruptions, as *erysipelas*, and the *eruptive* fevers.

Is the disease moist or dry, or is it in a state which will end in moistness and afterwards dryness? This inquiry is necessary, for the eruption may be seen in the condition of a vesicle, which, when pricked, lets out a clear or slightly cloudy exudation, or the vesicular state may be over, and in its place is a sore or scab with an exudation, purulent or sero-purulent; or a later stage may be reached, in which scales have replaced the original eruption.

Sudamina, *miliaria*, *herpes* represent the vesicular stage. *Eczema*, if advanced, is usually observed in an oozing or leeting condition. So also is *scabies*.

Bullæ may be considered as an enlarged form of vesiculæ, being observed at first as bladder-like prominences, coming out rapidly, containing at first serous fluid, which becomes purulent or sero-purulent. The blebs burst, and on the sites of the former elevations large black crusts form. The larger size, the rapid development, and the more appreciable bad health distinguish *bullæ* from *vesiculæ*. *Rupia* and *pemphigus* are examples of *bullæ*.

Under the condition of moistness or dryness may also be considered what are termed *pustules*. Pustules are situated on a hard inflamed base; and Willan states "that the *true pustule* differs from a vesicle in containing pus from the first moment of its detection as an individual skin disease apart from the inflammatory hard condition with which it commences."

Pus cannot be absorbed, and so it seeks the surface and bursts naturally or is assisted by the lancet; and large scabs or a permanent cicatrix are seen as results.

To this order belong *Ecthyma* and *Impetigo*.

Is the condition papular or scaly? and has this been the primary state of the eruption?

A papule in skin phraseology is solid ; it is small ; it is pointed ; it is raised above the surrounding skin, and as such it can be felt and recognised. As a rule also with a papule there is itching, and a non-contagious history.

In this order are observed *lichen* and *prurigo*.

A scale means an altered epithelial cell, and it may either be primary, or secondary following on an advanced and probably healthy stage of a previous eruption. As a primary disease, scales may be seen large or small, thick or thin, crowded together in patches or widely diffused. Scales are easily detached and quickly reproduced.

Psoriasis, *pityriasis*, and *ichthyosis* belong to this class, and are placed in the order of their frequency, psoriasis being frequently seen, ichthyosis being rare.

Is the skin eruption in the form of a tumour? The tumour in skin diseases is usually tubercular in character. It indicates degeneration. It may be small or large. It may remain stationary, not breaking down, or it may end either in ulceration or suppuration at its summit. The *tuberculæ* are chronic, sometimes hereditary, and in their graver forms are peculiar to tropical climates.

In this country we have *acne*, *lupus*, *molluscum*, *keloid*, representing the tumours or tuberculæ of skin diseases ; in tropical countries *elephantiasis* and *frambæsia*.

Is the eruption pigmentary? If so, and if the skin is bronzed in appearance, and this condition is most marked on the face, neck, superior extremities, navel, penis, and scrotum, it is Addison's disease (or disease of the supra-renal capsules) ; if leaden in hue, most evident on the face, it is due to the discoloration which has attended the internal administration of nitrate of silver.

The diseases of pigmentation depending on excess of pigment, deficiency of pigment, and aberration of normal colour, must be carefully diagnosed, as the treatment, spoken of afterwards, varies considerably.

Pomphi, or wheals, are rounded, elongated elevations of the true skin, attended by active congestion and

effusion of serum into the meshes of the skin ; they are pale in the centre, appear and disappear with great rapidity, and are attended by an extreme degree of tingling and itching. Their occurrence seems intimately dependent on changes in the nervous system. They are seen principally in *urticaria*, or nettle-rash.

Excoriations are simply abrasions, and exhibit merely a ruffling or actual detachment of the epidermis. They often result from scratching.

Ulcers differ from excoriations in the fact that they involve the true skin, and when they heal they leave a cicatrix.

Rimæ, or fissures, are well seen in the cracks found on chapped hands.

Crusts consist to some extent of epidermic scales, but most largely of dust and desiccated blood, serum, or pus.

A *cicatrix* is the mark left by the healing of a wound or ulcer. In some forms of lupus cicatrisation goes on subcutaneously, the morbid tissue being replaced by cicatricial tissue without breach of surface.

Guided by the preceding remarks, a student will naturally, in examining a case of skin disease, ascertain—1, the patient's history ; 2, see the whole of the patient's body if possible ; 3, note the situation of the eruption ; 4, observe the extent and distribution of the eruption ; 5, note the shape of the lesions ; 6, note the colour and see if it disappears on pressure ; 7, observe whether the eruption is symmetrical, elevated, infiltrated, or has an abrupt edge ; 8, is the eruption moist or dry ? 9, should the eruption be on a hairy part, the condition of that hair as to length, elasticity, lustre, ease or difficulty with which they are extracted, state of the bulb, etc., should be noted.

Diagnosis.—He will then form his diagnosis, which depends mainly on the characteristic appearance of each eruption, aided by the history, constitution, age, duration, cause, regional distribution—in a word by experience, for no verbal description can equal the advantage of having seen and touched diseases of the skin.

Prognosis.—The prognosis is generally favourable—favourable to life. Skin diseases yield to treatment if the causes and conditions are rightly apprehended and the requisite means adopted.

Certain skin diseases, however, are essentially incurable, for we may improve, but we cannot cure, *e.g.*, strumous eruptions or elephantiasis or epithelioma.

Treatment.—The treatment of skin diseases is constitutional or local, combined or distinct. Thus, constitutional treatment is sufficient in all the forms of syphilis except the ulcerative; local treatment is alone required in psoriasis (non-syphilitic). Usually, however, a combination of constitutional and local treatment is necessary, the former to combat the cause of the eruption, the latter to soothe the local irritation. Inflammatory affections must be treated by mild tonic aperients, followed, when the inflammation has subsided, by special tonics, as iron, arsenic, and quinine. For the non-inflammatory group arsenic is the special remedy.

Local Treatment.—Oxide of zinc ointment alone or combined forms the basis of soothing ointments. Chronic eczema requires stimulating applications, as tar or oil of cade, while lupus and epithelioma are attacked by caustics.

For special purposes, according to the special nature of the skin affection, we have distinct remedies, thus—lotions, to relieve pruritus; sulphur or other application to remove scabies.

The student should also remember the anatomy of the skin, how compound it is in its nature—consisting of a rete mucosum, a horny covering—the epidermis, an apparatus of sebiparous and sweat glands, a special growth of the derma—the hair, together with vessels, nerves, and lymphatics. A distinguished dermatologist has in consequence recently classified skin diseases under—1, diseases of the circulation; 2, of nutrition; 3, of sensibility; 4, diseases of the rete mucosum; 5, diseases of the epidermis; 6, diseases of the glandular apparatus; 7, diseases of the hair follicles and hair.

This arrangement, however excellent it may be in

theory, is rather cumbrous and complicated for a beginner, and the classification of Willan will be better understood.

The following classification is that of Willan, considerably modified and extended :—

- Order 1. **Exanthemata** : Erythema, Roseola, Urticaria, Pellagra.
- „ 2. **Vesiculæ** : Sudamina, Herpes, Eczema, Cheiropompholyx.
- „ 3. **Bullæ** : Pemphigus, Rupia.
- „ 4. **Pustulæ** : Ecthyma, Impetigo.
- „ 5. **Papulæ** : Lichen, Prurigo, Pruritus.
- „ 6. **Squamæ** : Psoriasis, Pityriasis, Ichthyosis.
- „ 7. **Tuberculæ** : Elephantiasis, Molluscum, Lupus, Framboesia, Keloid, Scleroderma, Morphoea, Verruca.
- „ 8. **Pigmentary Affections** : Leucoderma, Canities, Lentigo, Chloasma, Melanoderma.
- „ 9. **Diseases of the Hair, Nails, and Glands of the Skin** : Hirsuties, Alopecia, Trichorexis Nodosa; Onychia; Seborrhœa, Comedo, Acne; Hyperidrosis, Anidrosis, Bromidrosis, Chromidrosis.
- „ 10. **Parasitici** : Pediculosis, Scabies; Tinea Circinata, T. Sycosis, T. Tonsurans; Tinea Favosa; Tinea Decalvans; Tinea Versicolor.

EXANTHEMATA.

ERYTHEMA.—There are three chief varieties of erythema.—1. *Erythema Simplex* may be defined as consisting of superficial and usually dusky red patches, varying in size and severity, disappearing under pressure, and terminating in resolution and desquamation. It is an affection which is generally acute in its course, and it may be accompanied by little or by very considerable constitutional disturbance. It has a sub-variety, “erythema fugax,” so called from its shifting character, and its appearing and disappearing at intervals on different parts of the body. Sometimes it is observed in fevers on the

face, trunk, and upper extremities, and its appearance on such occasions forms an element in determining an unfavourable prognosis. 2. *Erythema Papulatum* is often seen in young persons at the age of puberty, and is usually associated with some disorder of the menstrual or digestive functions. Small papules may appear on any part of the body, but, as a rule, the sites selected are the back of the hands, neck, or face. These papules spread and coalesce with one another until the parts affected are covered with a red blush, which lasts for a few days and then disappears, with some itching. 3. *Erythema Nodosum* has a nodular appearance, the knots or patches being about one or two inches in diameter, attacking the surface of the legs between the knee and the ankle. It is always attended by much gastric and general disturbance, and often by articular pains and swellings, resembling exactly those of rheumatism. It is more common among females than among males, and occurs generally between the ages of 15 and 30. There are also sub-varieties, *Erythema læve* and *Erythema iris*.

Treatment.—Mild saline aperients are serviceable for simple erythema (F. 24). Rest in bed and tonics, more especially quinine or cinchona, are recommended for erythema nodosum; if the articular symptoms be prominent, the salicylates will prove useful. Greasy applications aggravate all the varieties of the disease, but soothing dusting powders (F. 55) give relief. Cloths soaked in whisky and water are also useful in the simple and papular forms; while the spread of the migratory variety may usually be checked by the application of a strong solution of nitrate of silver.

ROSEOLA.—Rose-coloured, bright spots, small and of various shapes, not much elevated above the surrounding skin, distributed more or less over the body, and accompanied by some fever, characterise this affection. The roseola seen in infants might be mistaken for measles, but it has no regular site for its eruption, at one time appearing on the neck, and at another on the buttocks;

nor is it accompanied by catarrhal symptoms, but is attended with some itching.

Treatment.—Alteratives, laxatives, and tonics may be required, according to the state of the system at the time the roseolar eruption appears (F. 8).

URTICARIA, or nettle-rash, bears, as its name indicates, more or less resemblance to the eruption produced by the application of a common nettle to the skin. Hence, wheals or raised elevations are observed, of irregular form and uncertain duration, with a white centre and red margin, and accompanied by more or less tingling and itching. Urticaria may be either acute or chronic. In the former the disease runs a rapid course and is attended with a smart fever; in the latter it is slow, obstinate, and either persistent or tending to come and go. Both forms seem to be due to errors of diet, as eating shell-fish, cucumbers, or almonds; or to indigestion and uterine derangements of various kinds.

Treatment.—In the acute form give an emetic, and follow it up by a purgative. In the chronic form attend carefully to the digestion by ordering a simple diet without wine, beer, or spirits, and administer laxatives or antacids. An occasional tepid bath is useful, while a lotion containing prussic acid or perchloride of mercury relieves the local irritation (F. 55a, 57a, 57b).

PELLAGRA is a disease met with chiefly amongst the peasants of northern Italy, Spain, and southern France. It occurs particularly in the spring (vernal insolation), and is marked by successive attacks of erythema (erythema pellagrosus) on such parts of the body as are exposed to the direct rays of the sun. The red swollen patches become pigmented in the centre, afterwards bleached and atrophied, and finally desquamation takes place. Symptoms of mental derangement may develop, or the patient may die from exhaustion.

Prognosis.—If left to run its natural course, Pellagra is usually fatal. With proper treatment, however, a cure may be looked for in about 78 per cent of the cases (Erasmus Wilson).

Treatment.—An early onslaught on the complaint is important. Exposure to the sun's rays should be avoided, and improved hygienic precautions adopted. Soothing lotions locally are indicated.

VESICULÆ.

MILIARIA (*synonym*—Sudamina) are often seen in the form of round, pearly vesicles, like drops of water, in the course of rheumatic or typhoid fever, phthisis, or any other disease accompanied by excessive perspiration.

ZONA (*synonym*—Herpes Zoster, Shingles).—Here groups of vesicles, varying in size from a millet seed to that of a pea, are formed on inflamed skin, and these vesicles pursue an acute course and spontaneously disappear in from six days in the simpler forms, to twenty days in the more complicated. Herpes, in its simplest form, is sometimes seen on the lip in acute pneumonia or during the progress of a common cold, or on the prepuce as the result of sexual connection or of a constitutional rheumatic tendency. Hence the terms Herpes Labialis and Herpes Preputialis. A variety called Herpes Circinatus consists of a circular ring ($\frac{1}{2}$ to $\frac{1}{3}$ of an inch broad) with smooth skin in the centre varying from $\frac{1}{4}$ of an inch to 2 inches in width. The vesicles are often very minute, and, when they dry up, seem covered with small scales. Another variety to which considerable interest is attached, from its peculiar situation and its antiquity, for it was known to the ancients, is popularly denominated "shingles," or technically "herpes zoster." The vesicles in this case form a band half encircling the body, and following, in nineteen cases out of twenty, the course of the intercostal nerves on the right side, in the position that would be occupied by a sword-belt. The eruption of herpes zoster is usually preceded by some constitutional disturbance and attended by considerable local pain. The patches vary in size from 2 to 3 inches, and are red, irregularly oval, and distinct. On this ground-work the vesicles are situated, sometimes distinct, but at other times running into one another. The disease lasts from fourteen to twenty days, and is succeeded by scabs. Before the eruption appears, the fever and the situation of the pain have led to its being mistaken for pleurisy.

Treatment.—Regulate the diet and attend to the bowels. Employ locally the prussic acid lotion (F. 57*b*), or dust the part with a powder consisting of three parts of starch and one part of oxide of zinc. If the pain be severe, as it sometimes is in shingles, it may be necessary to use aconitia ointment, or to inject morphia in the course of the nerve. Protecting the part by means of cotton wool is frequently very beneficial; so also is the application of a coat of collodion, but this should be painted on before the vesicles break.

ECZEMA.—Eczema is the most common of skin diseases. It is inflammatory in type; it may be acute or chronic; and, from its nature and the parts involved by the disease, it is slow and difficult to cure. It is essentially a moist, leeting, exudative form of a skin affection.

Etiology.—Hyperæmia is the proximate cause of eczema. The exciting causes may be local or constitutional—local, as chemical or mechanical irritants, heat or moisture, friction, and interrupted circulation; and constitutional, as when disturbed nervous influences produce changes in the circulation and in the secretions of the skin. These nervous influences are indicated by the occasionally sudden onset of the attack of eczema, and the readiness with which at times the disease yields to the administration of nervine sedatives. Nervous weakness leads to mal-assimilation of food, impaired digestion, painful menstruation—in a word, a weakened constitution; and any irritant can thus more readily excite on the skin the eczematous eruption. The exposure to the sun's rays of a person of weakened constitution is perhaps the most frequent exciting cause of eczema in city life. Warmth, moisture, and the irritation of the wash-tub are active influences in causing eczema on the arms and hands of washerwomen. The disease only seems hereditary in so far as an eczematous parent may transmit a feeble constitution to the offspring.

Symptoms.—The signs of eczema are redness, slight swelling, papulation, vesication, EXUDATION, incrustation, desquamation, thickening, fissures, and chapping. The

sensations of the patient are burning heat, itching, and pain. The whole of these signs or sensations may not be present at one time, and the preponderance of one over the other mentioned gives rise to varieties in the names of eczema. Thus, if redness is marked, the eczema is termed *eczema erythematosum*; if papules or pimples are very visible, *eczema papulosum*; if the exudation gives rise to vesicles, *eczema vesiculosum*, which again may terminate in *eczema pustulosum* or *impetiginosum*; if the vascular base be of a deep-red colour, *eczema rubrum*. When the exudation is dried up and crusts have formed, it constitutes the *crusta lactea* of children. *Eczema squamosum*, *eczema fissum*, and *eczema hypertrophicum* are varieties, in which the condition of the skin is sufficiently described by their names. When one particular symptom, as dryness, is very marked, we have the condition termed *eczema siccum*; while, when the opposite condition of moisture obtains, we have *eczema humidum*. *Acute* and *chronic eczema* are differentiated according to the severity; and *eczema infantile* according to the period of life.

Eczema, especially in infants, is often associated with bronchitis. The disease in the adult may be connected with asthma, or it may alternate with hay asthma. Not unfrequently eczema is seen in gouty and rheumatic cases; boils and hæmorrhoids are often its concomitants. The course, termination, and prognosis of eczema are determined very much by the variety the disease assumes, the health or exhaustion of the patient, and the presence or absence of recuperative power. On the whole, eczema, carefully treated, though a very troublesome and tedious, is also a curable disease.

Treatment.—Satisfactory treatment is impossible in eczema unless the type of the disease, the stage of its development, and the constitution of the patient be correctly interpreted. Unduly active measures, local or constitutional, may do more harm than letting the disease alone. Timid treatment, again, in severe cases, when powerful means are necessary, certainly prolongs and intensifies the disease.

Eczema is essentially a disease of debility, and indicates lack of vital power; hence tonic treatment is requisite. Before, however, commencing this, it is absolutely necessary that the digestive system should be regulated by appropriate remedies. Thus, saline purgatives with bitter infusions must be given, until the bowels act regularly, and signs of inflammation have departed. Then decided tonics should be administered, as citrate of quinine and iron; or strychnia; or cinchona with sulphuric acid. If there is lack of assimilative power, give citrate of potassium and ammonia; if nervous irritability exists, bromides are useful (F. 69 *et seq.*); if the gouty diathesis prevails, colchicum or iodine, with glycerine (F. 68b).

After these remedies have succeeded in their object, liq. arsenicalis may in small doses (2 to 4 minims thrice daily, after meals) be judiciously prescribed. Arsenic, however, should never be given in the early stages, nor until all traces of inflammation have disappeared, and the assimilative and digestive processes are going on properly. In eczema with gout it is not a successful mode of treatment; while, in eczema infantile, on the contrary, arsenic may be given from the first.

The local treatment should be soothing in the acute stages, and ointment of oxide of zinc with dilute hydrocyanic acid (F. 61) may be applied. The ointment should be applied on strips of lint and should not be washed off, as the object is to form a protective covering. In the earliest stages, oxide of zinc in lime water is valuable, or the eruption may be dusted with starch powder, or starch with oxide of zinc powder, or fullers' earth.

The best applications to relieve excessive itching are the preparations of tar or oil of cade, especially a combination of soft soap, tar, and alcohol, more or less diluted, with the addition of dilute hydrocyanic acid.¹

When eczema is accompanied with much infiltration and cedema, especially in the extremities, water dressing with a waterproof envelope to induce sweating has been

¹ Conium baths are referred to in the Appendix, p. 538.

found successful as a night application, while ointment of oxide of zinc is used during the day.

In very chronic cases with hardness and condensation, it may be necessary to blister, or to use a strong alkaline solution or soap. For subacute eczema, especially of the extremities, a modification of Hebra's unguentum diachylon, composed of equal parts of lead plaster and vaseline (F. 59), answers very well; it should be applied on strips of lint.

CHEIRO-POMPHOLYX.—This affection is marked by an eruption, invariably symmetrical, of small round vesicles or blebs, chiefly on the hands and feet, and attended by little or no redness of the skin, and by no eczema; it is very apt to recur. The vesicles are deep-seated and flat on the top, and soon dry up and scale off; they contain a clear, alkaline, serous fluid. The nails also are often attacked, being loosened and broken across at the root.

Treatment.—As the disease often appears in nervous and debilitated subjects, tonics, such as quinine and iron, will be useful. Locally, simple vaseline may be applied, or vaseline with a little tar ointment or liq. carbonis deterg.

BULLÆ.

PEMPHIGUS (*synonym*—Pompholyx).—The eruption, consisting of large bullæ, is usually preceded by fever and constitutional disturbance, and locally by irritation and itching. The bullæ may be two or three inches in diameter, and are either separate or run into one another, and, when they burst, are succeeded by large brown crusts. The disease is one of debility, favoured by intemperance, bad diet, or cold, or it may be due to syphilis. The course is chronic.

RUPIA is generally syphilitic in its origin. Small flat bullæ arise, and their contents, which consist at first of serous fluid, soon degenerate into blood and pus. A thick black scab is formed, and beneath it unhealthy ulceration progresses, as evidenced by a nasty-smelling discharge. The margins of the surrounding skin inflame, more serum is poured out, and the incrustation takes on a stratified

appearance, resembling a *limpet shell*. The lower limbs and loins are the usual sites of *rupia*. Its duration may vary from two or three weeks to several months.

Treatment.—Both these diseases being attended with debility, a generous diet and fresh air, with wine and tonics, are essential. If the eruption is of syphilitic origin, iodide of potassium, with Plummer's pill or the perchloride of mercury, may be administered. In non-syphilitic pemphigus, Fowler's solution of arsenic, in five-minim doses after food, may almost be depended upon to effect a cure. Locally, poultice and use antiseptic dressings (F. 3, 5); or better, dust the sore with iodoform.

PUSTULÆ.

IMPETIGO (*synonym* — *Eczema pustulosum*). — The pustules characteristic of this disease are sometimes crowded together, at other times distinct,—hence the division into *impetigo figurata* and *sparsa*. In both divisions the pustules break and are succeeded by scabs, which have a peculiar “candy-sugar” appearance if observed on the face. The *crusta lactea* of young children is simply an impetiginous eruptive mask. The variety “*sparsa*” is sometimes distributed over a wide area, as the limbs, the body, or the buttocks.

Impetigo generally attacks young, scrofulous, ill-fed children, or elderly debilitated people.

ECTHYMA may be confounded with impetigo, as both diseases are pustular and attended with scabs; but in ecthyma the inflammation is of a more severe type, and there is more constitutional disturbance. The pustules are usually separate, with a hard inflamed base, and terminate in the formation of a dark-coloured scab. The latter leaves superficial ulcers, followed by cicatrices. Ecthyma may occur spontaneously, or follow the application of some irritant to the skin.

Treatment.—This is similar to what was mentioned in the previous diseases, viz. cleanliness, good living, and

good air, with wine and bark. If the scabs are large, apply a charcoal poultice and a sedative ointment of acetate of lead and lard, or F. 57c, 59a, or 61.

PAPULÆ.

LICHEN.—There are three great varieties of lichen : 1. simplex, 1. circinatus (or circumscriptus), and 1. ruber (or planus). Lichen is an inflammatory affection of the skin, chronic in its course and characterised by the eruption of persistent papules, which are arranged in groups, or scattered thickly over the surface, and are usually associated with much itching. In *lichen simplex* these papules are about as large as a millet seed, and are chiefly found on the back and extensor surfaces of the limbs. This variety is considered by some to be simply abortive papular eczema. In *lichen circinatus* the papules are arranged in round groups or, more commonly, in perfect rings which spread circumferentially, leaving the skin in the centre either normal or stained of a yellowish-red colour. These patches occur generally on the chest and back. In *lichen ruber* (or *planus*), a disease of middle life, the papules are very large, flat, and smooth, and covered on the top by a thin, glistening scale, are deep purplish-red in colour, and are developed round the hair-follicles ; they are very persistent, and when they disappear they leave behind them deep dark stains. The eruption occurs in patches, at first on the limbs, but subsequently also on the body. It is often symmetrical, and is accompanied by intense itching. What is known as *lichen agrius* is simply acute eczema ; it constitutes the “grocers’,” “bakers’,” and “bricklayers’” itch. In it the papules are situated on red inflamed skin ; there is much pain, tingling, and heat, with general feverishness, nausea, and vomiting ; the tops of the papules are often broken off, and there is in consequence a thin serous discharge, the skin being left fissured with deep and painful cracks. In the lichen of scrofulous subjects, *l. scrofulosorum*, a very chronic variety, the papules are

very small and pale, appear only on the trunk, cause almost no itching, and are arranged in patches or circles. *L. tropicus* is known as "prickly heat."

Treatment.—In lichen the local treatment consists in the allaying of the severe itching by baths, sedative ointments, or lotions (F. 55a, 57a), or by weak tarry applications (F. 60a, 64b), while the digestion is aided by mild laxatives and a simple diet. Cleanliness must be insisted on. In *l. circinatus* especially, and also in the other forms of lichen, arsenic is most valuable. In *l. scrofulosorum* cod-liver oil must be used, both internally and externally.

PRURIGO has the same derivation as pruritus, and is sometimes dependent on the same causes. As a distinct affection it implies a neurosis which leads to defective nourishment of the skin, and is observed chiefly in old people when the action of the skin is weakened. It then causes not merely itching, but burning or gnawing pain. The sensations are, however, very variable, and sometimes there may be a feeling as if animals were eating their way through the skin. The skin in such cases presents numerous papules raised above the surface and covered with small black crusts, the result of scratching; while abrasions are present due to constant scraping with the nails. Such a state of matters is a typical picture of *prurigo senilis*, which is obstinate and difficult to heal, and gives rise to great nervous irritability.

Treatment.—The digestion must be attended to, and an evacuation of the bowels solicited every morning. Diet should be generous, and arsenic should be given. Bromide of potassium (F. 69, 70a) is frequently required at night to procure rest. Locally heat and shampooing after a Turkish bath are effective, if followed by the smearing of the skin with vaseline. In some cases the disease only yields to lotions of tar with borax and dilute hydrocyanic acid, or a hot decoction of poppy-heads with bicarbonate of sodium.

PRURITUS (*prurire*, to itch).—The derivation of the

word expresses one of the most characteristic features of prurigo, viz. itching. Itching accompanies many cutaneous affections which involve the ends of the sensory filaments, as scabies, eczema, pityriasis versicolor, and psoriasis in its early stages. It is notably absent from syphilitic eruptions and leprosy, which attack the lower layers of the skin.

As a separate disease three special forms of pruritus are noted:—

1. *Pruritus genitalium*.—This form is seen in diabetes mellitus, and in women at the change of life or when suffering from uterine diseases involving the os uteri, or when pregnant. In men it depends on eczema or uncleanness; and in both sexes it may be due to the presence of pediculi pubis.

2. *Pruritus ani*.—In adults this form is connected with piles, eczema, or constipation; in children, with threadworms.

3. *Pruritus senilis*.—This form is met with in old age, and may either be due to pediculi vestimentorum, or occur as a purely nervous affection.

Treatment.—If no parasites are detected, tar and sulphur are the best remedies. The former should be applied in the form of liquor carbonis detergens (Wright's), the latter may be prescribed thus: \mathcal{R} sulphidi potassii $\mathfrak{z}\text{iv}$, aquæ calidæ cong. xxx . Fiat balneum. Carbolic acid and opium also give relief. For pruritus of the genitals use: \mathcal{R} glycerini boracis $\mathfrak{z}\text{ii}$, aquæ ad $\mathfrak{z}\text{vi}$. Fiat lotio. For pruritus ani, \mathcal{R} hydrarg. subchlor. $\mathfrak{z}\text{i}$, ungt. zinc. $\mathfrak{z}\text{i}$. Ft. unguentum.

SQUAMÆ.

PSORIASIS (*synonym*—Dry Tetter) is a common chronic skin eruption, marked by the proliferation of white silvery scales from thickened patches of skin, which have a hyperæmic base, are usually circular in shape, and are of variable size. Healing commences from the centre, which gives rise to the characteristic appearance of rings of

eruption. It is dry throughout its whole course, and is accompanied by slight itching. It is very often arranged symmetrically, and is most common on the extensor surfaces, such as the points of the elbows and knees. It may involve the whole surface, but is rare on the palms and soles. When the spots are exceedingly minute the eruption is termed *psoriasis punctata*; when somewhat larger, *p. guttata*; while *p. nummularis*, *orbicularis*, *gyrata*, *diffusa*, *universalis*, and *inveterata*, are names which require no explanation. Psoriasis is frequently hereditary, is very apt to recur, and often seems in no way to affect the general health. *Syphilitic* psoriasis is not uncommon on the palms and soles, is somewhat coppery in colour, and its scales are thick and less silvery than in simple psoriasis; the patient's history, the discovery of other signs of syphilis, and the presence of other syphilitic eruptions on the body, will confirm suspicion in any doubtful case.

Treatment.—In simple non-specific psoriasis, arsenic is a valuable remedy. Tar capsules and carbolic acid have also been given with advantage in some cases. In the syphilitic variety mercury is necessary; and by preference Donovan's solution¹ should be prescribed in 20-minim doses thrice daily after food. Locally, chrysophanic acid,² in the proportion of ʒi to ʒi of lard, is by far the best application, and its use causes non-specific psoriasis to heal in most instances within ten days. It requires to be rubbed in over the affected patches with considerable vigour, and the nurse must not be afraid of her hand being stained. Soap and warm water will remove stains from the hands and bedclothes; but, during the time the chrysophanic ointment is used, the patient should, for the sake of economy, keep to bed and sleep between the same sheets. It appears to act constitutionally as well as locally, for in several cases where, for

¹ Now in B.P. as *Liquor Arsenii et Hydrargyri Iodidi*.

² Now in B.P. as *Chrysarobinum*. The B.P. unguentum contains gr. xx. to one ounce of benzoated lard. This is much too weak to be effectual in psoriasis.

experiment sake, it was applied to one side only—the other extremities being protected by being wrapped in cotton wool—the eruption was removed from the whole of the affected skin. In attempting, however, for the sake of cleanliness, to give it internally in $\frac{1}{3}$ -grain doses, it was found in some cases to cause so much vomiting as to lead to its disuse. In dandriff, citrine ointment, and glycerine and rose-water (F. 64, 64a), do much good.

PITYRIASIS.

PITYRIASIS RUBRA is a formidable complaint, not unfrequently fatal and often accompanied by renal disease and albuminuria. It is characterised mainly by intense redness of the entire surface of the body, excessive exfoliation of epidermis, and absence of infiltration of the skin and of moist exudation. The skin is tender, but not very itchy. The constitutional symptoms are severe, and are those chiefly of exhaustion and debility. It is by some regarded as a dry, universal form of eczema. The vivid redness of the skin and the great size of the epidermic flakes which fall off, sufficiently distinguish it from other desquamative diseases.

Treatment is too often futile, though Fox states that by soothing applications externally and the administration of diuretics and then tonics internally, really remarkable results may be obtained. The tender surface is thus protected, while the hyperæmia is subdued and tone and strength are restored to the system.

ICHTHYOSIS (or *fish-skin*) is simply an exaggeration of the condition known as *xeroderma* or dry skin. It is usually hereditary, and is marked by suppression of the secretion of perspiration and an increased development of epidermis. The skin is therefore dry, harsh, scaly, and cracked, the peculiar shape of the scales giving the disease its distinctive name. It appears first and is most severe on the extensor aspect of the joints.

Treatment.—The disease is incurable; but the patient may be made more comfortable by warm baths, followed by thorough inunction with almond oil or glycerine and water. Cod-liver oil should be given internally.

TUBERCULÆ.

ELEPHANTIASIS (see page 133).

MOLLUSCUM (*mollis*, soft) is a term applied to soft tumours of the skin, consisting of an overgrowth of connective tissue. It is thus a "fibroma," and Virchow calls it *Fibroma molluscum*. Another variety of tumour, of smaller size, not larger than a pea, the result of specific degeneration of the cells of the rete Malpighii, is contagious, and is termed *Molluscum contagiosum vel sebaceum*.

Sometimes the growths in the first form of molluscum attain a large size, being as large as a melon or an orange; or, again, they may not be larger than a millet seed. The blood-vessels in the large varieties are always distended, particularly the veins, and may be observed through the skin, twining round the base of the lobes.

Treatment.—In the large form the knife must be used; in the smaller, scissors. In *Molluscum contagiosum* it is necessary to cut with the lancet and press out the contents. The capsule then contracts or dies.

LUPUS is the principal tubercular skin disease seen in this country. Its essential feature is the deposition in the skin of a new cell-growth resembling granulation tissue, which tends continually to invade the surrounding healthy parts. In the variety known as *lupus exedens* these nodular deposits ulcerate; in *l. non-exedens* they do not. In the non-ulcerative form the nodules, which are small, softish, and red, and attended by no pain, become covered with little white scales. Then a sort of fatty degeneration occurs, the nodules shrink and die away, and leave a depression due to a loss of substance. In the other form ulceration instead of absorption sets in, the neighbouring tissues are invaded, and the edges are thick and red. It sometimes destroys the nose, including the mucous membrane and bones. Both varieties appear to be connected with scrofula, to be most common between the ages of fifteen and twenty-five, and to affect by preference the face, especially the nose and cheeks. Another variety of lupus is *l. erythematosus*. It is superficial in character, and occurs most often in females, usually appearing first as an irregular reddish or violet-coloured spot on the

nose, whence it spreads on both sides to the cheeks, producing the well-known butterfly-shaped patch. It may be developed on any part of the face, however, and has been seen on the scalp. This erythematous condition is followed by superficial cell-infiltration, gradual breaking-down of the tissues involved, and the formation of a shallow cicatrix. Its course is very slow. In its early stages the patches are sometimes covered by firmly-adherent greasy crusts.

Treatment.—The scrofulous nature of lupus necessitates the use of tonics, especially cod-liver oil combined with syr. ferri iodidi or with acids and bitters. In the severe form, if there is any history of syphilis, use Donovan's solution or iodide of potassium with sarsaparilla. Locally, for the non-ulcerating form Sir Erasmus Wilson recommends the acetum cantharidis; while for the ulcerating type caustic applications are called for, such as chloride of zinc, nitric acid, or potassa fusa, or the lupous tissue may be scraped away with a curette. The thermo-cautery applied under chloroform is specially serviceable, and leaves little after pain. For "lupus erythematosus" a local application of tincture of iodine, or equal parts of carbolic acid and glycerine, or an ointment composed of half a drachm of liq. carbonis deterg. to an ounce of vaseline, may be employed.

FRAMBÆSIA (see page 135).

PARTIAL FIBROMA, CHELOMA (χηλή, a claw).—Cheloma is a tumour of the skin resulting from overgrowth of the connective tissues within the corium. It may be accidental, associated with a cicatrix, or idiopathic, the result of nutritive disturbances.

Anatomical Characters.—Cheloma in its aggregate form is seen as a flat plate, is raised above the adjoining skin for a quarter of an inch, and sinks below the corium to the same extent. From its throwing out processes, like claws, into the surrounding skin, it has obtained its name.

Cheloma may be solitary, or composed of five or six tumours, discrete or confluent; while as many as fifty or sixty tubercles have been met with.

Course and Prognosis.—Its course is attended with no severe symptoms, and if left alone it may disappear spontaneously. It has no tendency to desquamation or ulceration.

Treatment.—Surgical treatment should be avoided. The best treatment is mercurial or iodine plaster, or emplastrum plumbi. Sir Erasmus Wilson recommends painting with a spirituous solution of soap and iodide of potassium, covering this with an adhesive plaster spread on wash-leather, and repeating the application as often as the plaster becomes loosened. This method is assisted by small doses of perchloride of mercury.

DISEASES OF PIGMENTATION.

Synonym—Chromatopathic affections.

1. **EXCESS OF PIGMENT.**—Excess of colour may be general or partial. In either case it is represented by increase of the normal pigment of the skin, giving rise to various shades of hue, ranging from olive to deep black. Examples of excess of pigment are seen in *Chloasma* and *Melasma*.

2. **DEFICIENCY OF PIGMENT.**—Defect of colour in the skin is due to absence or deficiency of pigment, and this may occur either in the rete mucosum or the hair. As a general affection, it constitutes Albinism—the subject of it being known as an Albino; while as a disease, it is termed *Leucopathia*, and its examples are *Achroma* and *Leucasmus*.

3. **ABERRATION OF NORMAL COLOUR.**—Alteration of the colour of the skin is manifested by an excess of the elements which enter into the composition of the normal brown or black. Thus it may be yellow or olive (*Xanthochroia*), as in *Ephelis* and *Lentigo*. Excess of yellow-blue—a rare affection—is termed *Cyanochroia*.

4. **ARTIFICIAL COLOURING OF THE SKIN.**—*Argyria* or *Melasma Tinctum* occurs from the prolonged internal use of the nitrate of silver. The seat of the discoloration is the papillary layer of the corium.

A slight functional disorder may occasion arrest of the pigment-formation to a varied extent and become the cause of *Achroma*, as illustrated in the instance of the piebald negro. *Lentigo* is one of the commonest forms of *Melasma*, and is a natural concomitant of a delicate skin. *Ephelis solaris* and *Ephelis ignealis* result from the action of heat. "Copper colour" is a form of *Melasma*, and is seen in syphilitic affections. *Morphoea* and *Scleriasis* are accompanied by *Achroma* as well as *Melasma*, and so also to a greater degree is *Elephantiasis*. The prolonged use of arsenic gives rise to *Melasma*. *Melasma* with *Achroma* is sometimes associated with hysteria, nervous shock, and notably with Addison's disease—"bronzed skin." *Melasma* is generally seen in prurigo.

Prognosis.—The skin rarely returns to its normal state, and the prognosis is thus unfavourable.

Treatment.—Pigmentary affections are usually associated with constitutional derangement and therefore require internal treatment, while the discoloration may be dealt with by local remedies. Of the latter the most effectual are alkaline lotions and ointments, lotions of acetic and hydrochloric acid, or of iodine and iodide of potassium. Hydrargyri perchloridum in *Mistura amygdalæ* will remove freckles and the slighter forms of *Chloasma*; and the pigment is sometimes restored by the stimulation of *Cantharides*. Friction is serviceable in every form of pigmentary discoloration.

DISEASES OF THE HAIR, NAILS, AND GLANDS OF THE SKIN.

HIRSUTIES, or undue growth of hair in abnormal situations, may sometimes be cured by the cautious use of depilatories (F. 65e). A more satisfactory method of treatment is to destroy the hair-papilla by means of a needle thrust to the bottom of each follicle, or by means of the electrolytic needle, the inflammation so excited obliterating the hair follicle completely.

ALOPECIA (or baldness) may be the result simply of hereditary peculiarity, or of ordinary senile atrophy, in which the hair papilla takes part with the other tissues; or it may be due to syphilis, the eruptive fevers, parasitic disease, seborrhœa, or nervous affections.

Treatment.—While the cause of the baldness must be specially treated, the growth of the hair may be favoured by stimulating local applications (F. 62), and by general tonics. In syphilis, the hair will certainly grow again under suitable constitutional treatment.

COMEDO is characterised mainly by thickening of the skin and plugging of the hair follicles by masses of dry sebum, the protruding tip of this plug being usually blackened by the dirt adhering to it. It is most common at puberty, and is found most often on the face and shoulders. In the sebaceous plugs are found large numbers of minute hairs, and occasionally the *acarus folliculorum*, a parasitic animal whose habitat is the hair follicle.

Treatment.—Expression of the sebaceous masses. Steaming the face at night, followed by vigorous friction and the application of stimulating ointments or lotions (F. 57f), will usually prove successful.

ACNE consists of an eruption of pustules produced by inflammation of the hair-follicles and sebaceous glands.

It is frequently merely a more advanced stage of Comedo, and is found in the same situation and in patients of the same age and type. If there be much surrounding induration, the affection is termed *acne indurata*. *Acne rosacea* is a variety associated with intemperance, good living, or disease of the stomach or liver. It appears usually about the nose and mouth, is accompanied by much hyperæmia, and many tortuous and widely-dilated vessels are seen winding over the surface.

Treatment.—In *acne simplex* and *acne indurata* much the same line of treatment as for comedo should be adopted; in the severer forms the iodide of sulphur ointment may be used (F. 65). In *acne rosacea* the diet should be regulated and the drinking habits stopped; locally, the application every night of the liquid extract of ergot is said to be useful.

DISORDERS OF PERSPIRATION.

1. **HYPERIDROSIS, EXCESS OF PERSPIRATION.**—This is supposed to depend on the vaso-motor nerves, but in what manner is still obscure. It may be either “general” or “local.” General hyperidrosis arises from various causes, as acute rheumatism, gout, intermittent fever, phthisis, general debility, alcoholism, defervescence of febricula, emotional excitement, exercise, and hot weather. It is also produced by diaphoretics and the Turkish bath.

“Local hyperidrosis” usually occurs on one side of the body, the face, or the head. It may be seen in hemiplegia following central hæmorrhage. It is sometimes hereditary, and is occasionally limited to the palms of the hands and the soles of the feet.

2. **ANIDROSIS**, or deficiency of sweat, is a symptom in diabetes mellitus and chronic Bright’s disease. It accompanies the early stages of fever, and is present when the skin is dry, as in psoriasis or ichthyosis.

3. **OSMIDROSIS.**—The sweat is sometimes retained on the skin and has a bad smell. Especially is this the case with that secreted by the armpits, perinæum, genitals, feet, and toes, and to this condition the term “osmidrosis” is applied.

4. **CHROMIDROSIS.**—In this rare condition the sweat is coloured.

5. **HÆMATIDROSIS.**—This is called “bloody sweat.” Doubt exists if it ever occurs spontaneously. In a number of the cases

reported the condition seems to have been due to self-inflicted punctures.

Treatment.—In excessive sweating—Hyperidrosis—dilute sulphuric acid and other astringent tonics are useful (F. 17a). Flannel instead of cotton should be worn next the skin, and sponging with vinegar and water is recommended; or use lotions of dilute sulphuric acid ℥ii, aquæ Oi, or acid. tannici ℥i, spiritus vini rectificati ℥vi. Atropine injected subcutaneously checks the perspiration of phthisis, and belladonna liniment is useful in excessive perspiration of the hands.

For osmidrosis—fœtid sweating—tar soap, frequent changing of linen, and thorough drying are recommended. Internally, give tincture of belladonna. Hebra's prescription for fœtid sweating of the feet is "℞ olei olivæ optimæ ℥xv, lithargyri ℥iii et ℥vi. Boil. Make an ointment, and apply on strips of linen every twelve hours." Cork soles should also be worn.

PARASITICI.

PEDICULOSIS (*synonym*—Phthiriasis) is the condition of skin induced by uncleanness and the harbouring of lice about the person. There are three varieties of pediculi. The *pediculus capitis* infests the head, especially of children, where its presence excites great itching and irritation, the scratching to which it gives rise occasionally causing eczema. The "nits" or ova of the lice, small white bodies, adhere to the shaft of the hair. The *pediculus corporis* is larger than the head louse, and its ova are deposited on the clothing, not on the skin. The itching which it excites is intense. The great irritation brings out numerous small pale papules, especially on the breast and back; the tops of these are scratched off, and are usually seen covered by a small scale of coagulated blood. After some time the skin deepens in colour from increased pigmentation. The *pediculus pubis* is found chiefly about the genital organs, or occasionally in the armpits, or in the eyebrows and eyelashes. It is seldom seen in children.

Treatment.—For head lice or pediculi pubis nothing is better than carbolic oil (1-8) or the 5 per cent solution of oleate of mercury. If the latter remedy be combined with a little acetic ether it will rapidly destroy the nits.

Carbolic lotion (1-20) will kill body lice; but the clothing should also be exposed to the action of dry heat at a temperature of at least 250° F. The disease of the skin engendered by the presence of the pediculi is "easily cured by means of an ointment containing one part of the oil of Delphinium Staphisagria and seven parts of lard" (Liveing).

SCABIES depends on the presence of an animal parasite, the *acarus scabiei* or *sarcoptes hominis*. The insect is rounded, somewhat like a tortoise in general shape, and is provided with eight legs. The male is smaller than the female, and wanders freely over the surface. The female pierces the cuticle, and forms under it a short S-shaped burrow or cuniculus, at the end of which is a small vesicle within which the insect lies; in the burrow will be found ten to fifteen black dots, the insect's eggs. It most frequently attacks the flexures of joints; notably it is first observed between the fingers, whence it may spread over the whole surface of the body with the exception of the face, upon which it is never seen save in a few cases in infants. The deposition of the acarus acts as an irritant; a vesicular eruption is formed, and with this is associated much itching, which is specially increased by warmth. The only certain evidence of the presence of the disease is the discovery of the insect and its burrows, but in the absence of this the following points are usually held to warrant such a diagnosis:—(1) A clear history of contagion, several members of the same family being generally affected; (2) the steady spread of the disease from one part to another; (3) intolerable itching, intensified by warmth, pain and the burning sensation characteristic of eczema being absent; (4) the detection of small pointed vesicles between the fingers and on the flexor and ulnar aspects of the wrists, with a pruriginous eruption on the front of the forearm, on the mammæ, genitals, and inner side of thigh, the face and scalp being in adults invariably untouched. A valuable diagnostic sign in children is the presence of the eruption round the ankles, on the buttocks, and on the ulnar side of the wrists.

Treatment.—The acarus is most easily destroyed by the application of sulphur ointment (F. 60b). This should be rubbed in firmly for THREE NIGHTS in succession, and washed off by a warm bath on the fourth day, when the underclothing should be changed. The clothes worn should be fumigated by sulphurous acid gas, or destroyed. If the sulphur be continued TOO LONG, it gives rise to a very troublesome artificial eczema. In infants, and those whose skin is too irritable to bear the sulphur application, storax (F. 60c) may be used.

TINEA TRICOPHYTINA is, in all its modifications, connected with the presence of a fungus named the *trichophyton tonsurans*. It is popularly known as ringworm, more especially when it attacks the head or body. On the scalp it is known as *tinea tonsurans*; on the hairy parts of the face, as *tinea sycosis*, from the resemblance of the affected part to the pulp of a fig; on the general surface of the body, as *tinea circinata*; the affection designated *eczema marginatum* is simply a severe form of this disease, met with generally in tropical countries.

Tinea Tonsurans is commonly seen in children, rarely in adults. At the outset the rings or patches are simply red, slightly raised, with a few small vesicles at the edges; subsequently there are observed round or oval, scaly or scurfy patches of comparative baldness, on which the hairs are dry and shrivelled, usually broken off short at the surface of the skin or a line or two above it, in such a way as to suggest the appearance of a stubble-field; the hairs are brittle and apt to break just within the follicle when epilation is attempted. At a still later stage the diseased part of the scalp may become inflamed, soft, and boggy, as if the seat of an abscess, and the follicles may suppurate or discharge a clear gummy fluid; this is the condition sometimes described as *tinea kerion*, and is one of nature's methods of cure. In disseminated ringworm of the head the scalp is scaly, with here and there a few dry, shrivelled, and brittle hairs, and a few of the stumps above mentioned.

Tinea sycosis is characterised by pustular inflammation of the hair-follicles, the pustules being placed on little hard eminences, and terminating in yellowish-brown crusts.

Tinea circinata is marked by distinctly circular patches, which tend to spread steadily at all parts of their circumference; in extent they vary from the size of a shilling to that of a half-crown; their margins are red, raised, and slightly vesicular, while the centre has a yellowish-brown colour and has a tendency to scale.

TINEA FAVOSA or **FAVUS**, a very obstinate and chronic affection, is due to the presence and growth of a fungus, the *achorion Schönleini*. It is most commonly met with on the scalp, though it may occur on other parts of the surface. In the early stages the patches are irritable and scaly, and the hair becomes harsh, dry, and quite lustreless; bright sulphur yellow crusts, small and distinctly cup-shaped, are soon formed, and through the centre of each of these pass a few hairs; eventually the crusts fall off, leaving dark stains and a scaly surface. The pressure of the fungus may destroy the hair-papilla, when permanent baldness results. The odour of the parts is said to be like that of cats or mice.

TINEA DECALVANS (*Alopecia areata*) affects the beard, scalp, and eyebrows, and presents smooth, ivory-white, sharply-defined bald patches of a circular form, which may so extend as to cover a large surface and leave the patient absolutely destitute of hairs. It is usually developed suddenly, attacks persons of all ages, and runs a chronic course, the first indication of improvement being the growth of small, downy, pale hairs, named *lanugo*. Most authorities regard it as due to the presence of a fungus named the *microsporon Audouini*; but its parasitic nature is doubted by some, who attribute its occurrence to disease of the nervous system, or to a wave of inflammatory or other influence, which, as it passes over each hair papilla, leaves it enfeebled and dying.

TINEA VERSICOLOR (*Pityriasis versicolor*, *Chloasma*) is produced by the growth of the *microsporon furfur*. It is characterised by the occurrence of yellow or fawn-coloured patches, often very symmetrical, on the chest and abdomen, occasionally on the upper arm or thigh; these are rough to the touch, and covered with fine branny scales. It is sometimes accompanied by considerable itching. It is a disease of adult life, and never attacks uncovered parts.

Treatment.—In all forms of Tinea this must be both local and general; local to destroy the parasites, general to strengthen the system and prevent the skin forming a suitable soil for their development. The general treatment consists in cleanliness, good hygienic conditions, nourishing food, cod-liver oil, syrups of the phosphate or iodide of iron (F. 81, 85).

Locally, poultice to remove scabs, then clip the hair and epilate carefully in and around the diseased patches, this epilation being particularly necessary in favus and sycosis; afterwards, some parasiticide application must be employed, such as sulphurous acid, either pure or diluted, or oil of cade. In Favus the part may be blistered, or a lotion of corrosive sublimate (F. 58, 58a), or the white precipitate ointment, should be used perseveringly; hyposulphite of sodium lotion, 60 grains to the ounce of water, is also effectual. In ringworm of the body a solution of nitrate of silver, or tincture of iodine, or acetic acid, is sufficient. For Sycosis employ, after epilation, F. 65 or any of the ordinary parasiticides. Ringworm of the head, if extensive, is obstinate; for it, after carefully extracting the diseased hairs, apply oleate of mercury, sulphurous acid, carbolic acid and glycerine, or Dr. Alder Smith's *compound citrine ointment* (F. 57g, 65b, 65c). In ringworm, according to Dr. Lee, begin by shaving the head. Destroy hat or cap worn before treatment. Then treat by rubbing in the following preparation:— \mathfrak{z} i of precipitated sulphur is to be mixed with \mathfrak{z} i of olive oil till a thick cream is produced, to which is added gr. 32 of Calvert's carbolic acid. Nurses may

convey the contagion on leaving their situation, or a cap brought from an infected house may do so. *Tinea versicolor* is readily removed by vigorous rubbing with soft soap and warm water applied with a piece of flannel; F. 58a is still more effectual. In *Tinea decalvans* blister occasionally, or use F. 58.

MEDICINAL RASHES.—Certain drugs, taken internally, are apt to give rise to skin eruptions. Belladonna or its alkaloid, stramonium, and hyoscyamus sometimes cause intense hyperæmia, closely resembling the eruption in scarlet fever. Quinine sometimes brings out patches of erythema; arsenic, a purplish staining of the skin or a herpetic eruption; iodide of potassium, purpuric spots on the legs, or pustules, like those of acne, on the face, back of neck, and shoulders; copaiba, a dark red, raised, hyperæmic or hæmorrhagic rash, not unlike that of measles, seen most usually about the ankles and wrists; bromide of potassium, erythema and acne round the mouth and nose; chloral hydrate, a dusky erythematous eruption, sometimes combined with urticaria, found most often about the face and neck; mercury, an obstinate form of eczema; tar and allied substances, a very itchy variety of erythema.

The external use of certain drugs is apt to give rise to skin eruptions. Thus, tar sometimes produces a form of acne; arnica, an erysipelatous inflammation; while the erythema caused by mustard, turpentine, or other irritants is often followed by desquamation and brown staining, which may be permanent. Croton oil and remedies of a similar nature sometimes excite a very acute eczema, which leaves well-marked cicatrices. The croton oil eruption may be mistaken for small-pox.

Treatment.—These eruptions, after the drug which has caused them has been withdrawn, should be treated simply on general principles.

APPENDIX.

METHOD OF PERFORMING POST-MORTEM EXAMINATIONS.¹

BEFORE opening the body the external appearances are to be observed—the presence of injuries or marks of any sort, the state of the post-mortem rigidity, and the cadaveric lividity, as well as the degree of coldness of the body, are to be carefully noted.

Head.—It is better to begin by opening the head, for the condition of the blood-vessels in the meninges can thus be more accurately examined, than if, the chest having been opened, the blood is permitted to flow out at the cut ends of the large veins. To open the head, make an incision across the vertex from ear to ear, quite down to the skull. In making this incision the most ready means of parting the hair is to cut the skin from one ear to the other, from within outwards with the back of the knife to the skull; and this preliminary cut having been made, it can be deepened by a second sweep of the knife. With the chisel, the scalp, including the periosteum, is now pushed forwards over the brow, and backwards over the occiput, giving room for the saw to pass round the skull in a horizontal plane about $\frac{3}{4}$ inch above the orbit, and $\frac{1}{2}$ inch above the occipital protuberance. The saw-cut should not go quite through the two tables; the inner one is to be cracked in the line of the saw-cut with the chisel and mallet, the former of which may then be used to prise the skull-cap off. In cases of injury to the head, it is better to carry the saw-cut quite through both tables all round, and then cut the brain clear through at that level with a long knife.

Split up the longitudinal sinus with fine scissors, and with a probe-pointed bistoury divide the dura mater all round along the edge of the skull and cut its attachment to the crista galli. Then pull the dura mater backwards, exposing the surface of the arachnoid. Now remove the brain from before backwards, taking care not to tear any part of it, and divide the spinal cord

¹ This "method" was written by the late Dr. Foulis, Pathologist to the Glasgow Royal Infirmary.

as low down as possible. Examine the base of the brain, remove the dura mater from the base of the skull, and examine the bone, opening the internal ear if necessary with the chisel.

The examination of the interior of the brain itself is begun by opening the lateral ventricles by two longitudinal incisions along the corpus callosum; after which the knife is laid parallel to the corpus callosum, and the brain is sliced laterally in such a way that each cut stops just short of the convex surface of the hemisphere. The third, fifth, and fourth ventricles may now be opened; and finally a series of closely placed transverse incisions may be made across the corpora striata and optic thalami to expose their texture in every part. The medulla oblongata is split longitudinally, and a cut through each half of the cerebellum may be made.

Trunk.—With a strong knife an incision is made down the middle line of the trunk from the suprasternal notch to the pubes, opening the abdominal cavity. The soft parts are held back from the lower edge of the thorax, and an incision carried through the peritoneum along the lower costal cartilages, after which the dissection of the flesh from the front of the thorax can be done with long sweeping cuts. The costal cartilages are then cut half-an-inch from the anterior ends of the ribs, beginning with the second cartilage, and thence passing downwards to the lower margin of the thorax, the cut inclining outwards as it descends. In cutting these cartilages hold the knife with the handle level, so that as each cartilage is cut the edge of the knife may fall on the next cartilage and not plunge into the lung; but, in cutting the first costal cartilage, which must next be done, the knife is to be held perpendicularly with the edge towards the clavicle, and directed rather outwards to avoid the manubrium sterni. Then cut the sterno-clavicular and costo-clavicular ligaments by an incision curved from above downwards and outwards, and remove the sternum. Note the position of the heart, etc., and the state of the pleuræ and peritoneum, and open the pericardium, pinching up a part of it and cutting it horizontally. Having observed its contents, open the heart. This may be done *in situ* by two incisions along the anterior and posterior borders into the ventricles; or the heart may be removed, and afterwards opened by the incisions just mentioned, followed by a cut along each side of the septum ventriculorum from the apex into the pulmonary artery and aorta. The state of the valves, of the heart tissue, and of the ascending arch of the aorta can then be studied. The lungs may now be removed and divided by one long cut from apex to base. The bronchi are split up with scissors, and the trachea and larynx similarly split up with the knife. If desired, the great median incision first described may be continued up to the chin, and the tongue, fauces, larynx, and upper half of the

gullet can be removed bodily and examined in detail afterwards.

Now divide the diaphragm so as to let the liver fall back into the chest, open the stomach (if this has not already been done), and clean out its contents. Then examine the spleen, kidneys, ureters, bladder, and urethra, not forgetting the supra-renal capsules. The state of the gall bladder and its duct must now be ascertained. For this purpose carry the incision in the stomach along the duodenum, past the orifice of the ductus communis, wipe the surface of the mucous membrane, and putting gentle pressure on the gall bladder, note whether the bile flows freely from the duct. Then examine the portal vein and remove the liver, which may be divided by long transverse incisions. To examine the bowels, remove them from the body, separating them with the knife along the edge of the mesentery as close as possible to the gut. Split the gut from end to end with the gut scissors, and examine the mucous surface under a stream of water.

The mesenteric glands, aorta, and pancreas may next be looked at, and then the front of the spine should be cleared of all soft tissue. Any lateral curvature or exostosis will thus come into view, and the spinal canal can then more readily be opened. This may be done from before or behind. If from before, the bodies of the vertebræ are to be separated by saw or chisel; if from behind, the cadaver must be laid prone, a longitudinal incision made from the occiput to the sacrum, and the soft tissues removed from the spinal arches, which are then to be cut with the saw and forceps.

WEIGHT OF ADULT ORGANS.

	MALE.	FEMALE.
Brain	49 oz.	44 oz.
Heart	10 oz.	9 oz.
Lungs { right . .	24 oz.	17 oz.
{ left . .	21 oz.	15 oz.
Liver	53 oz.	45 oz.
Spleen	4 to 10 oz.	4 to 10 oz.
Kidney	4½ oz.	4 oz.

THERAPEUTICAL INDEX.

ACARUS SCABIEI (F. 60*b*, 60*c*).

Sulphur Bath (Sulphurated Potash, $\mathfrak{z}\text{iv}$. in water **xxx**. gallons). Lotion containing 5 gallons of water, a quarter of a pound of quicklime, and half a pound of sulphur, boiled down until 3 gallons are left.

ACNE.

Sulph. Iod. (F. 65).

Sulphur (F. 57*f*).

AGUE.

Quinine (20 to 30 gr. at the close of the paroxysm); or hypodermically (dissolved in tartaric acid).

Mineral Spas—Bath, Carlsbad, Marienbad, Tarasp, Spa.

ANÆMIA.

Blaud's Pill, Iron Mixture (F. 91*b*, 77, 78, 79).

Mineral Spas—Schwalbach, Ems, St. Moritz, Homburg, Brückenau, Harrogate, Tunbridge Wells.

ANGINA PECTORIS.

Nitrite of Amyl Capsules; or Nitro-Glycerine, two to three drops on sugar, of a 1 per cent solution in Sp. Vin. Rect.

Mineral Spas—Teplitz, Ustron.

APOPLEXY.

Croton oil, two drops on butter placed on back of tongue.

If hæmorrhage seems to continue, Ergotine should be injected.

ASCARIDES (F. 30).

Santonin. For thread worm, Enemata of Quassia, Liq. Calcis, or infusion of tea.

ASCITES (F. 27*a*).

Acetate of Potassium (37, 37*a*), or Elaterinum (F. 27). Trousseau's wine (F. 40*a*).

ASTHMA (F. 51).

Inhalations (Potass. Nitras, Stramonium cigarettes). Iodide of Potassium (F. 5). Lobelia Mixture (F. 46). Arsenic (F. 4). Nitrite of Amyl capsules. Strong coffee.

Climatic Treatment—Amélie-les-Bains, Bournemouth, Montreux, Isle of Wight.

BED-SORES.

If unbroken, alum and brandy.

If broken, charcoal poultice, and Iodoform dusted on.

BILIOUSNESS (F. 23).

Calomel (F. 23). Rhubarb, aloes (F. 26). Jalap, Syrupi Zingib., Decoct. Aloes Co. (F. 25).

BRIGHT'S DISEASE.

Acute.—Warm-bath, hot fomentations, dry cupping. Elaterium and Ext. Colocynth. Co. (F. 27). Potass. Acet., Squills, Sp. Eth. Nit. (F. 37, 37a).

Chronic.—Wearing flannel, milk diet.

Elaterium (F. 27). Pilocarpine (F. 34b). Iron (F. 76, 77, 78, 79). Potass. Iod., 20 grs. thrice daily.

Extreme cases, Southey's drainage tubes.

Pure Iron Springs—Alexisbad, Brückenau, Schwalbach, Spa.

Compound Iron Springs—Homburg (Louisen), Tunbridge Wells, Marienbad, Pyrmont, St. Moritz.

BRONCHITIS (acute).

Early stage, hot poultices of linseed meal. Vin. Ipecac., Tolu, Acacia (F. 45).

Vin. Antimon., Ziiss., Sp. Chloroformi, Ziil., Aq. Camph. Ziiv., a tablespoonful every two hours.

Vin. Ipecac., Liquor. Ammon. Cit., Tinct. Camph. Co. (F. 34).

After acute stage is past, Carbonate of Ammonium, Infusion of Senega.

BRONCHITIS (chronic).

Medicinal Treatment—Tolu, Ammoniacum, Opium (F. 43).

Squills, Acid. Sulph. Dil., Tinct. Camph. Co., Cascarella (F. 21).

Ammon. Hydrochlor. gr. 6, Sp. Chlor. m. 10, Syrupi m. 30, every three hours.

Inhalations—Pine, Creasote, Iodine (formulae of B.P.)

„ Ipecacuanha Spray (F. 54a).

BRONCHIECTASIS.

Ol. Terebinth. m. xx.

BRONCHITIS (FIBRINOUS).

Emetics (F. 41, 42). Potass. Iod., Calumba (F. 5).

Climatic Treatment. — Bournemouth, Cannes, Gmunden, Hyères, Madeira, Meran, Weissenbourg, Torquay, Isle of Wight.

Mineral Spa Inhalations. — Ems, Lippspringe.

CATARRH.

20 m. of Tinct. Opii. or m. x. of Liq. Morph. Hydroch., and m. viii. of Vin. Antimon.

Taking of no liquid for twenty-four hours may check incipient cold.

If running at eyes and nose has commenced, the inhalation of spirit of camphor sprinkled on a handkerchief, and Sulph. Quin. gr. x. given internally; or Turkish bath.

In chronic sneezing, "Vapor Iodi," 120 drops in a pint of boiling water inhaled for five minutes night and morning.

Whey Cure. — Gais.

Mineral Spas. — Aix-les-Bains, Ems, Landeck, Baden in Austria, Neu-Ragoczy.

CHLOROSIS.

Ferrum Redactum, 2 grs., twice daily for fourteen days.

Then Ferri et Quin. Citras, et Ammonii Carb. (F. 76).

Tinct. Ferri Perchlor., Acid. Hydroch. Dil., et Inf. Calumb. (F. 78).

Tinct. Ferri Perchlor., Glycerin., et Inf. Calumb. (F. 79).

Or, BETTER THAN THESE, BLAUD'S PILLS IN INCREASING DOSES DAILY (F. 89).

Or Ferr. Dialysat. 5 m. four times daily.

Good food; change of air.

Mineral Spas. — Schwalbach, Homburg (Louisen), Kissingen, Tunbridge Wells, Marienbad, Cannstadt.

CHOLERA.

Prophylactic, careful dietary, no fruit, sanitary precautions.

For prodromic diarrhœa, various astringent remedies. Basis of these should be Acid. Sulph. dil. and Opium (F. 16, 17, 18), or Castor Oil, ʒi. et Tinct. Opii 10 drops.

If Cholera commenced, astringents useless.

Essential Oils, Ether, Liq. Halleri (F. 18a), and Acid. Carbol., 2 gr. added to each dose.

If reaction begun—

Ice, aerated waters, brandy.

Morphia subcutaneously to allay cramps.
 Turpentine stupes to abdomen.
 Sinapisms to feet.

CHOREA.

In extreme cases, chloroform inhaled to allay fits ; artificial feeding.
 Liq. Arsenicalis in increasing doses, with Decoct. Cinchon. (F. 4).
 Liq. Arsenicalis with or without Iron.
 Arsenic continued four to five weeks until constitutional symptoms of its action are seen.
 Then Arsenic stopped, and replaced by liquid preparations of Iron (F. 81).
 Or, Hypophosphite of Lime (F. 82).
 Or, other tonic preparations (F. 75, 76, 78).
Mineral Spas. — Bourboule-les-Bains, Mont-Dore (contain arsenic).

COLIC, "Biliary."

Calomel and Jalap (F. 23).
 Tinct. Podophylli 15 drops every second night.
 Pil. Hydrarg. gr. 2, Ext. Colocynth. Co. gr. 1, Ext. Hyoscyam. gr. 1, followed by a Seidlitz powder, or Sulph. Magnes. mixture (F. 24).
 Biliary Colic (with passage of gall-stones), Leeches to hepatic region. Sodii Bicarb. $\mathfrak{z}\text{i}$. in one pint of hot water—repeated. Liniment. Opii, Camph. et Chloroformi (F. 57A).

Lead Colic.

In ordinary cases—Sulph. Magnes. Mixture (F. 24).
 In extreme cases—Ol. Croton. 1 to 2 m. in butter, followed, when bowels have acted, by Potass. Iod., small doses (F. 5).
 If paralysis is present, constant current daily.
Mineral Spas. — Carlsbad, Homburg, Kissingen, Tarasp Vichy, Marienbad, Cheltenham, Leamington, Scarborough.

Renal Colic.

Hot fomentations, administration of chloroform, morphia subcutaneously.
 Ol. Junip., Sp. Aeth. Nit., Tinct. Digital. (F. 39).
 Nitrate of Potassium, Barley Water (F. 40).
Mineral Spas.—Vichy, Tarasp, Carlsbad.

CONGESTION (Cerebral).

If acute—

Leeching behind ears; quick, strong purgatives—Ol. Crotonis 1 to 2 m. on butter; Calomel and Jalap (F. 23), followed by Potass. Bromid., Ext. Ergot. Liq. (F. 71a).

If following on mental strain—

Laxatives, light diet, white meat, chicken, etc. Liq. Arsenical. (F. 4).

Sea voyage. Complete rest.

If chronic, Hypophosphites (F. 82).

CONGESTION OF LIVER.

Leeches to hepatic region, followed by hot poultices.

Pil. Hydrarg., Ext. Coloc. Co., Ext. Hyoscyam. (F. 27a).

After pill, give Seidlitz Powder or Mist. Sulph. Magnes. (F. 24).

Tinct. Jalapæ, Syrup. Zingib., Decoct. Aloes Co. (F. 25).

Afterwards Tonics—Acid. Nitro-Mur. dil., Tinct. Gent., Decoc. Tarax. (F. 79a).

Mineral Spas.—Carlsbad, Marienbad, Franzensbad, Homburg.

Careful dry diet, avoidance of wines and beer.

Mineral Spas.—Carlsbad, Kissingen, Homburg, Marienbad, Tarasp, Cheltenham, Leamington, Harrogate.

CONSTIPATION.

Brown bread; ripe fruits; stewed prunes, fifteen to twenty being taken in the morning every two days. Hunyadi Janos, Friedrichshall, Æsculap mineral waters.

In chronic cases, for males, give a pill after dinner of Ext. Aloes, Ext. Gent., Ext. Nucis Vom. (F. 28a).

For females, Tamar Indien; Tinct. Jalapæ, Syrup. Zingib., Decoct. Aloes Co. (F. 25).

If with hæmorrhoids, Confect. Sennæ, Pulv. Glycyrrhizæ Co.

In old people, Ext. Belladon. $\frac{1}{4}$ gr. gradually increased to 1 gr. daily.

New Remedies—

Cascara Sagrada. Of the Fluid Extract, 10-30 m.

Euonymin, 2 gr. in pill.

Leptandrin, 2 gr. in pill.

Iridin, 3 grs. in pill.

Mineral Spas.—Kissingen, Nauheim, Tarasp, Homburg, Saldschütz, Leamington, Scarborough.

CONVULSIONS IN CHILDREN.

1. Lancing gums.
2. Castor Oil or Soap Enema.
3. Followed by warm bath.
4. After action of Bowels, Potass. Bromid. gr. 2 ; Syrupi Chloral m. x. in aq. ℥ss. every four hours.

CONVULSIONS IN ADULTS (Uræmic).

Inhalation of Chloroform.
 Chloral injections, 45 grs. to an adult (15 to a child).
 Injection of Pilocarpine (F. 34b).
 „ Digitalin, $\frac{1}{16}$ gr.

CONVULSIONS (Puerperal).

Chloral by Enema. Begin with 60 grains, and, if required, continue by 15-grain doses till an aggregate of 120 grains is reached.
 Inhalation of Chloroform.
 Venesection, question of (see page 345).
 If possible, hasten delivery by forceps.

DIPHTHERIA.

General treatment—

Tinct. Ferri Perchlor. m. xxx., Glycerini m. xx., every two hours.
 Or Potass. Iod. gr. iii., Pot. Chlorat. gr. iv., aq. ℥ii, every two hours.
 Subcutaneous injection of Pilocarp. Nitras, or Jaborandi internally. Ipecacuan. and Sulphate of Zinc as emetics ; or better, Apomorphia ($\frac{1}{16}$ gr.) hypodermically.

Local treatment—

Lactic Acid 1 part, Glycerine 50 parts, painted over the patches.
 Or Argent. Nitrat. ℥i., aq. ℥i. (Jenner).
 Throat-gargles—Acid. Carbolic. or Potass. Permang. 2 grs. to ℥i. of water.
 Glycerinum Boracis.
 Hot inhalations every quarter of an hour (Ertel).
 Lactic Acid ℥i., Aquæ Calcis ℥viii. To be sprayed over patches by ball spray apparatus.
 Tracheotomy, question of, see text, page 169.
 Affirmative answer, if obstruction is not below place where incision should be made.

Diet—Milk ; ice to suck ; stimulants, if powers failing.

For Secondary Paralysis—

Liq. Strychninæ Hydrochloratis (F. 80) ; constant current.

Mineral Spas in Secondary Paralysis.—Wildbad, Baden-Baden, Bagnères-de-Bigorre, Gastein, Plombières, Bath, Woodhall.

DROPSY.

(a) Removal of fluid by Skin—

Guaiacum and Nitre (F. 33).

Pilocarpine injections (F. 34b).

Turkish baths.

(b) Removal of fluid by Kidneys—

Squills, Liq. Ammon. Acetat., Decoct. Scoparii (F. 35).

Mercury, Squills, Digitalis (F. 36).

Potass. Bitart., Buchu (F. 38).

Potass. Nitras, Decoct. Hordei (F. 40).

Trousseau's Wine (F. 40a).

(c) Removal of fluid by Intestines—

Elaterium, Colocynth, Hyoscyamus (F. 27).

Potass. Bitart.

Pil. Cambogiæ Co.

Mineral Spas, Cardiac Dropsy.—Brückenau, Pyrmont, Schwalbach, St. Moritz, Stuben, Sternberg.

„ *Hepatic Dropsy.*—Griesbach, Kissingen, Carlsbad, Tarasp, Homburg, Cheltenham, Leamington.

„ *Renal Dropsy.*—Fachingen, Leuk, Vichy.

DYSENTERY (Acute).

Pulv. Ipecac. 25 grs., Sodii Bicarb. 10 grs., Syrup. Aurantii \mathfrak{z} ss. Repeat in eight hours ; if disease not checked, in four hours.

For two nights afterwards give 10 grs. of Pulv. Ipecac. ; and then 8 gr. doses of Pulv. Ipecac. Co. for four days.

A little Castor Oil after this.

During first eight hours no liquid ; but ice only to suck if thirst is great.

Dietary—Milk, yolk of eggs, strong soup. If great exhaustion, stimulants.

DYSENTERY (Chronic).

Here ulceration of intestines, hence Pulv. Ipecac. not necessary.

Vegetable astringents—Tannin, Rhatany, Gallic Acid (F. 19).

Mist. Cretæ, Cinnamon, Opium, Pulv. Aromat. (F. 18).

Or, twice daily, Pulv. Ipecac. Co. gr. v.

Bland nutritious diet. Sea voyage.

Mineral Spas.—Tarasp, Marienbad, Carlsbad, Spa, Franzensbad, Rehburg.

DYSPEPSIA (Various symptoms—various remedies).

1. Want of appetite, with acidity—

Ammon. Carb., Potass. Bicarb., Inf. Chiratae (F. 10).

Without acidity—

Acid Nitro-Mur. dil., Tinct. Gent., Decoct. Tarax. (F. 79a).

Or Quin. Sulph., Acid Sulph. dil., Syrup. Aurant., Tinct. Aurant. (F. 75).

Mineral Spas.—St. Moritz, Tarasp.

2. Nausea and vomiting—

Careful regulation of diet. Creasote, Sp. Chlor., Tinct. Camph. Co., Glycerine (F. 11a).

Acid. Hydrochlor. dil., Liq. Bismuthi, Sp. Chlor., Tinct. Card. Co., Aq. Camph. (F. 9).

3. Flatulence and belching—

Carminatives, Tinct. Card. Co., Tinct. Zingib., Sp. Ammon. Aromat. (F. 13).

If immediately after meals, Pepsine and Rhubarb (F. 91).

If with rotten-egg flavour, Charcoal Biscuits. Creasote (F. 11).

If with great acidity, Sp. Ammon. Aromat., Liq. Potass., Tinct. Rhei (F. 73).

Mineral Spas.—Kissingen, Homburg, Leamington.

4. Pain—Heartburn—

Liq. Bismuthi, Sp. Chloroformi (F. 9).

Wyeth's Soda Mint Tablets.

Magnesia, Soda (F. 11).

5. Cramp—

Calomel and Jalap, followed by carminatives, as Cardamoms and Ammonia (F. 13).

WATER-BRASH (Pyrosis).

Simply as a symptom of ordinary Dyspepsia—

Pulv. Kino Co. xii. grs., followed by a watery purgative, as Hunyadi Janos or Friedrichshall.

As evidence of Sarcinæ—

20 to 60 grs. of Sulphite of Soda.

Rules as to food and drink, see page 269.

ECZEMA.**Infantile Eczema—**

Small doses of Calomel followed by Liq. Arsenical. (F. 4).

Ungt. Zinc. (F. 59a).

Or Pulv. Rhei. gr. 1, Sodæ Bicarb. gr. 1, Hyd. c. Cret.
gr. $\frac{1}{2}$, vel. Sulph. Quin. gr. $\frac{1}{4}$. Ungt. Zinc. $\mathfrak{z}\text{i}$,
Vaseline, $\mathfrak{z}\text{i}$.

ECZEMA OF ADULTS (Acute).**General measures—**

Salines, laxatives (F. 24, 24a, 66).

Mineral acids (F. 16, 79a).

Cod-liver oil (F. 81).

Locally—

Dilute Hydrocyanic Acid, Perchloride of Mercury (F. 55a).

Lead and Glycerine (F. 57a).

Oxide of Zinc, Lime Water, Glycerine (F. 57c).

ECZEMA OF ADULTS (Chronic).

Simulating applications—Oil of Cade, Sap. Mollis, Sp.

Vin. Rect., Sp. Lavandul. (F. 60); Oil of Cade, and

Glycerine of Starch (F. 60a).

For subacute Eczema of Extremities—

Equal parts of Lead Plaster and Vaseline (modification
of Hebra's Diachylon Ointment (F. 59).

If much hardening of skin, Potash preparations (F. 57d
and 57e).

Mineral Spas.—Bath, Harrogate, Strathpeffer, Aix-la-
Chapelle, Schlangenbad, Wildungen, Lippspringe.

EMPHYSEMA.

Warm climate.

Stramonium Cigarettes or Nitrate of Potassium Papers (F. 51).

For cough—

Emetic of Ipecacuanha. Injection of Apomorphia, gr. $\frac{1}{12}$.

Antispasmodics—

(a) Tinct. Lobel., Sp. Æther., Tinct. Conii, Mist.
Ammoniaci (F. 12).

(b) Tinct. Card. Co., Sp. Ammon. Aromat., Acid. Hydro-
cyan. Dil., Aq. Carui (F. 13).

$\frac{1}{12}$ gr. of Apomorphia injected.

Warm climate.

Climate and Health Resorts.—Montreux, Bournemouth,
Lippspringe, Isle of Wight.

ERYSIPELAS.

1. Purgative—Calomel and Jalap (F. 23).

2. Followed by Tinct. Ferri Perchlor., 30 to 40 m. every
three hours.

3. When temperature lowered, 20 m. of Tinct. Ferri Perchlor. thrice daily.
 4. Fer. et Quin. Citrat., Ammon. Carb., Tinct. Aurant. (F. 76); or
 5. Iron, Calumba, and Glycerine (F. 79).
- Local applications—
 Dusting on Flour.
 Oxide of Zinc powder and starch.
 Collodion and Castor oil; or
 Painting whole surface with solution of Argent. Nitras.
 Line of demarcation on leg, with solid Nitrate of Silver.

ERYTHEMA.

Simple—

Rest in bed; Saline Aperients, as Magnes. Sulph. and Acid. Sulph. Dil. (F. 24).

Nodular—

Tonics—Quinine (F. 75), Cinchona (F. 4).
 Soothing dusting powders—Oxide of Zinc, Starch.

Papular—

Cloths soaked in whisky and water.

Migratory variety—

Application of solid Nitrate of Silver.

EXOPHTHALMIC GOITRE.

Iodine externally and internally.

For palpitation—

Tinct. Digitalis 6 m. thrice daily in water.
 Tinct. Belladon. m. v., Tinct. Ferri Perchlor. m. v., Aq.
 ʒss.

Mineral Spas.—Hall in Austria, Hall in Tyrol.

EPILEPSY.

During fit—

Loosen necktie, and put the head in such a position that it will not be injured. Piece of wood or indiarubber placed between teeth.

If of syphilitic origin—

Potass. Iodid., Hydrarg. Perchlor. (F. 1).

Other cases—

Potass. Bromid. in combination with other bromides, and give large doses—60 to 120 grs. daily for twelve months.

Atropine gr. ii., Sp. Vin. Rect. ʒii. Begin with 1 m. of this solution daily, increasing to 20 m.

Argent. Nitras ¼ gr. pill thrice daily; Zinci Acet. gr. ii.

Local applications to back of neck—

Cupping, setons. Blisters of doubtful utility.

FEBRICULA.

Saline purgative—Sulph. Magnes., Acid. Sulph. Dil., Aq. Ment. Pip. (F. 24), or Seidlitz Powder.

Followed by—

Diaphoretic Mixture—Liq. Ammon. Acet., Sp. Æth. Nit. (F. 31), or Nitrate of Potass, Decoct. Hordei (F. 40).

Or, at an early stage—

Tinct. Aconiti 1 m. every five minutes until 30 m. taken.

Diet of slops—milk, gruel, arrowroot. No animal food.

Convalescence aided by tonics, Quinine (F. 75), or Iron and Quinine (F. 78).

FEVER (Typhoid).

In early stages, a teaspoonful of Vin. Ipecac. may be given until vomiting is produced, if the patient is strong.

No PURGATIVE.

Then treat and watch symptoms. Patient in bed.

1. EXCESSIVE DIARRHŒA. If stools EXCEED four per day ; but NOT before—

Pil. Plumb. & Opio, one after every motion.

Mist. Cretæ, Aq. Cinnamomi, Tinct. Opii (F. 18).

Pulv. Cretæ Aromat. & Opio.

Catechu, Tinct. Opii, Mist. Cret. (F. 17).

Or enema of Starch and Laudanum (F. 22).

2. Hæmorrhage. Brandy, if exhaustion and weak pulse.

Ol. Terebinth. 10 to 15 m. every hour.

Acid. Gallic. x. grs. every four hours.

Hazeline, 25 minims after every motion.

Chlorodyne, use in the same way as Hazeline.

Subcutaneous injection of Bonjean's Solution of Ergotine, 10 min.

Note.—This injection specially useful if internal hæmorrhage is going on.

3. Delirium—

No physical restraint. Skilled nursing.

Potass. Bromid. (F. 70a), or with Chloral (F. 69).

Morphia suppository (rarely).

Exceptional treatment—

4. Cool Bath of 98° daily, gradually reduced to 78° if temperature above 105° or 106°.

5. Antipyretics—

Large doses of Quinine, 30 grs.

Digitalis and Quinine, or Digitalis alone.

Antipyrin, 24 grs. (F. 11k).

6. Stimulants—question of administering them, page 33.

7. Temperature of room 65° Fahr. Thermometric indications of patient's temperature noted daily on chart.
8. Diet—
Milk best at regulated intervals, two tablespoonfuls every hour or two hours.
Total milk per day 5 to 6 pints.
Iced water between these times.
Milk occasionally supplemented by mucilaginous drinks, barley water, oatmeal gruel, strong meat soup.
9. Convalescence—great care in changing diet; *no alteration till morning and evening temperatures are normal.*
Then, weak soup, arrowroot, beef-tea.
No solid food until ulcers are cicatrised. Evidenced by
 1. No pain on pressure in iliac region.
 2. Tongue clean.
 3. Temperature normal.
 Short drives before attempting walking exercise.
Tonics, Quinine (F. 75, F. 76).

FEVER (Typhus).

- Emetic at first—Vin. Ipecac., one teaspoonful until vomiting is produced.
Then, purgative—30 to 60 grs. of Pulv. Rhei Co.
Tepid water injections relieve after-constipation during fever.
Head shaved. Cooling lotions applied.
Skilled nursing. Temperature of room 65° Fahr.
Diet—Milk every two hours, 5 to 6 pints daily, and weak soups about midday and early morning.
Stimulants, question of (page 33).
Prevention of complications—
1. Bed-Sores—
Avoid pressure at buttocks. Water-bed.
Wash threatened parts with alum, white of egg, and brandy, or apply glycerine after washing carefully.
If, through INATTENTION, bed-sores have formed—
Charcoal poultice.
Sore dusted with Iodoform Powder.
 2. Pulmonary complications—
Poultices of linseed meal to chest.
Vin. Ipecac., Syrup. Tolu, Mucil. Acaciæ (F. 45).
Followed by Ammon. Carb. gr. v. every three hours in milk (page 32).
 3. Bed-clothes washed. Bed-pan always used.

FEVER (Relapsing).

Rest in bed, strong soups, milk, ice water charged with Carbonic Acid.

Cold application or continuous hot poultices to spleen.

10 m. of Acid. Phosph. Dil. in sweetened water every two hours.

If symptoms of collapse, Brandy and Carbonate of Ammonia.

If delirium, Chloral, 15 grs. every hour until ζ ii. taken, or Potass. Bromid. with Chloral (F. 69), or Potass. Bromid. alone (F. 70a).

Convalescence—Good diet, Wine, Quinine, and Iron (F. 76 and 78).

GALL-STONES (see Biliary Colic, page 482).

To prevent formation.

Resin. Podophyll. gr. $\frac{1}{2}$, Pil. Hydrarg. gr. ii., Pil. Colocynth. et Hyoscyam. gr. i.

Ether Sulph. m. 20 to 30, yolk of egg, Ol. Terebinth. m. 5 to 6, two or three times daily, until pain in side relieved, and exercise can be taken with impunity.

Mineral Spas.—Carlsbad, Marienbad, Tarasp, Franzensbad.

GOUT.

1. Brisk purgative—Calomel gr. ii., Ext. Coloc. Co. gr. iss. Calomel and Jalap (F. 23).

2. Then, when bowels freely moved—

Vin. Colch., Magnes., Magnes. Sulph., Aq. Cinnamom. A draught (F. 68a).

Tinct. Colch. Sem. ζ iss., Magnes. Carb. ζ iii., Aq. ζ vi. (F. 68). One tablespoonful thrice daily.

3. General rules as to administration of Colchicum, page 113.

4. Locally, perfect rest, and the application of a poultice sprinkled with Opium and Belladonna.

When inflammation has subsided, bandage and slight friction.

5. Diet during acute stage—

Milk, Arrowroot, Tea.

6. When fever abates—

Beef-tea, Chicken Soup, plenty of Lithia water.

Chronic gout.

Mineral Spas.—Leamington, Cheltenham, Bath, Vichy, Homburg, Carlsbad, Tarasp, Teplitz, Wildbad, Wildungen, Harrogate.

New treatment.—Dr. Mortimer Granville's.

Iodine treatment (F. 68c).

GRAVEL.

- (a) When urates predominate, Vichy or Carlsbad water, and Alkalies.
- (b) When Phosphates, Nitro-muriatic Acid and generous diet.
- (c) When Oxalates, plenty of cold water and no Sugar.

During passage of calculus—

Barley water, Sp. Aeth. Nitrosi.

Hypodermic injection of Morph. Acetas.

Warm poultices sprinkled with opium to the back.

Question of chloroform, page 353.

Mineral Spas.—Rohitsch, Sauerbrun, Roisdorf, Contrexéville, Vichy.

HÆMORRHAGE (Cerebral).

See Apoplexy.

HÆMORRHAGE from "Stomach" (Hæmatemesis).

Gallic Acid, 10 gr. every four hours (F. 19).

Ice to be sucked.

If hæmorrhage is very profuse, inject m. x. of *Injectio Ergotini Hypodermica*.

HÆMORRHAGE from "Lungs" (Hæmoptysis).

Hazeline, m. xxx. every two hours.

Acid. Sulph. dil., Tinct. Opii (F. 16).

Gallic acid (F. 19); or

Injectio Ergotini Hypodermica, 10 m.

HÆMORRHAGE from "Kidneys."

Ice to back.

Pil. Plumb. c. Opio, one every 3 hours.

Infus. Maticæ \mathfrak{z} i. thrice daily.

Ol. Terebinth. m. ii. to m. iii., Mist. Amygdalæ \mathfrak{z} ss. every 3 hours with caution. Stopped if pain or retention of urine ensue.

HEADACHES (Bilious).

Attended with general plethora, flushed face.

Strong purgatives, as Calomel; or Resin. Podophyll. with

Pil. Hydrarg., Ext. Colocynth. (F. 27a), followed by

Haustus Niger \mathfrak{z} iss.

Attention to diet and exercise, and avoidance of alcohol and aerated water of great importance.

HEADACHES (Nervous).

Potass. Bromid. in mixture (F. 70a).

Tinct. Guaranzæ in teaspoonful doses, especially in Megrim.

Strong tea or coffee.

Sea Voyages. Tarasp, St. Moritz, Lippspringe.

HEADACHES (Neuralgic).

Sulph. Quininæ gr. v., before paroxysm expected.

If with anæmia, Ferri et Quin. Citras gr. v. thrice daily.

During paroxysm—

Tea, or

Brandy and Soda-water in small doses. Liberal diet and change of air.

HEADACHES (Symptomatic).

Dependent on uterine diseases or catamenial irregularities.

Treat by appropriate remedies, according as the headache comes under one or other of the three varieties mentioned.

Potass. Bromid. gr. xx., thrice daily in latter cases.

Hot-bath, if catamenial period expected.

Mineral Spas.—Franzensbad, Ems, Schwalbach.

HEADACHES (due to Syphilis).

Potass. Iodid. and Hydrarg. Perchlor. (F. 1).

Donovan's Solution.

Mineral Spas.—Aix-la-Chapelle, Neuenahr, Harrogate.

HEART DISEASE.

If mitral, Digitalis with Iron at once (F. 89).

If aortic, no necessity for medicine at first; attention to diet, avoidance of excitement, regulation of bowels.

If aortic disease with failing compensation of heart, then

Digitalis (F. 89). The effect of the drug is to be judged by its action upon the urine—if urine increased, Digitalis does good; if not increased, no benefit is obtained from persisting with its administration.

Other drugs may be tried.

Asparagin 1 or 2 grs. daily with Potass. Bromide gr. 5.

Tincture of Convallaria, 12 m. thrice daily.

Citrate of Caffeine, 3 to 5 grs.

Casca bark in the form of Tinct. Erythrophlœi in doses of 5 to 10 m.

Waldenburg's apparatus.

When hydragogue cathartics necessary—

Elaterii $\frac{1}{4}$ gr., Pulv. Jalap. Co. xxx grs., every third night.

Mineral Spas.—Homburg, Kissingen, Tarasp.

HICCUPI.

Sucking Ice.

Spirit. Æth. 20 m., Tinct. Card. Co. ʒss., Aq. ʒss.; draught.

Inject. Morph. Hypoderm. 5 m. = $\frac{1}{2}$ gr. of Acet. Morph.

Inject. Nitratis Pilocarpin., $\frac{1}{4}$ gr. in x. m. of water.

Chloral Hydratis, Potassii Bromidi, Potassii Bicarbi. āā ʒi.,

Liq. Morph. Acetat. ʒi., Aq. ad ʒvi. Two tablespoonfuls every three hours.

If chronic—

Tinct. Physostigmatis m. x., Potass. Carb. gr. x., Mucilag.

Acaciæ ʒi. M. One dose thrice daily.

One teaspoonful of mustard infused in half-pint of boiling water, the infusion filtered, and draught given to patient.

HYSTERIA.

Charcot's Moral Treatment—

Removal from home surroundings.

During a paroxysm the inhalation of Chloroform or cold water dashed over patient.

If hyperæsthesia—

Potass. Brom. (F. 70a), or with Chloral Hydras. (F. 69).

If loss of sensation—

Constant current daily over affected part.

If vomiting—

Liq. Bismuthi and Acid. Hydrocyan. Dil. (F. 9).

If paralysis—

Constant current; Strychnine (F. 80).

If paralysis—

Hypophosphites (F. 82, 82a).

In many cases of hysteria—

Tinct. Valerian., Tinct. Asafœt., Tinct. Lavand. Co. useful (F. 14).

If Catamenial irregularities are the cause—

Potass. Bromid. gr. xx., Ferri et Ammon. Citrat. gr. iii.,

Sp. Ammon. Aromat. m. x., Aq. ʒi. S. et M.

Taken twice daily.

Mineral Spas.—Franzensbad (mud baths), Lippik, Wildbad, Teplitz, Lucca, Bath.

JAUNDICE (Dependent on Gall-Stones).

See Hepatic Colic.

JAUNDICE.

A slighter form not due to obstruction—

Mercurial preparations (F. 8 and F. 23).

Podophyllum (F. 27a).

Saline Draughts (F. 24) and Seidlitz Powder.

General dietetic treatment either alone or combined with

Acid. Nitro-Muriat. Dil. (F. 79a) or Strychnine (F. 85).

LARYNGISMUS STRIDULUS. (See False Croup.)**LARYNGITIS (Acute).**

Leeches to Larynx of adults—to manubrium sterni of infants.

Hot water compresses to throat.

Diaphoretics, Liq. Ammon. Acetat., Sp. Æth. Nitrosi (F. 31).

Inhalations of Ol. Pini Sylvest. or Creasot. (F. 53, 54).

Question of Tracheotomy, p. 175.

LARYNGITIS (Chronic).

Rely upon inhalations of Acid. Carbolic., Ol. Pini Sylvest.

(F. 53a, 54).

Chloride of Zinc 30 grs., Aq. ʒi., applied locally for a week.

Tannin and Glycerine, applied locally for a week.

Rest, dry climate, respirator.

Mineral Spas.—Carlsbad, Ems, Marienbad, St. Andreasberg.

LEAD COLIC.

Constipation in early stage—

Sulph. Magnes. (F. 24). If this fails, Ol. Croton. ʒ i.-ii. on butter.

Hot fomentations to abdomen to relieve pain.

To remove lead from system—

Potass. Iodid. (F. 5)—small doses.

For Paralysis—

Constant current daily.

LOCOMOTOR ATAXY (Tabes Dorsalis).

In early stages—

Well-regulated hydropathy, cold baths.

Spine rubbed with hot cloths at 70° to 80° Fahr., gradually lowered to 50° Fahr.

Sea voyage advisable.

Mineral Spas.—Bath, Baden-Baden, Franzensbad, Gastein, Peffers, Teplitz, Wildungen, Wildbad.

In advanced cases—

Argent. Nitras, $\frac{1}{4}$ grain doses in the form of pill, with bread, until 120 grs. are taken.

Potass. Bromid. to relieve fidgety sensation (F. 70a).

Nerve Stretching.

In far advanced cases—

Attention to symptoms.

MEASLES.

For children—Confectio Sennæ.

For young persons (F. 25)—Tinct. Jalapæ, Syr. Zingib.,

Decoct. Aloes Co.

To bring out the eruption, the old remedy, *Tinct. Croci*, is recommended in 10 m. doses every two hours.

In catarrhal stage—higher Diaphoretics—*Liq. Ammon. Acetat.*, *Sp. Æth. Nitrosi* (F. 31).

For cough—*Vin. Ipecac.*, *Citrat. Ammon.*, *Tinct. Camph.* Co. (F. 34).

Should bronchitis ensue the remedies recommended under that head should be referred to.

Diet.—As a rule, milk.

When low typhoid states exist, wine is specially necessary, with strong soup, and *Ammon. Carb. gr. iii.* every two hours.

Room darkened to relieve the photophobia if catarrhal ophthalmia is present.

MENINGITIS (acute).

Head shaved, ice applied, light excluded from room.

Active purgatives—*Calomel* and *Jalap* (F. 23), or *Croton Oil* 1 m. to 2 m. Mercury until salivation is imminent.

If mercury not given, then *Potass. Bromid.* in large doses (F. 70a).

Food should be solely liquid—Beef-tea, strong soup. If swallowing objected to, use beef-tea enemata.

MERCURIAL SALIVATION.

If "coppery taste," "spongy gums," "bad breath"—

Tinct. Myrrh., *Alum.*, *Inf. Rosæ Acidi*, as a gargle (F. 48). *Borax* and *Glycerine* (F. 50).

Potass. Iodid. in small and repeated doses (F. 5), preceded by *Potass. Chloras* for two days (F. 7).

For mercurial palsy—removal from exposure to fumes, and *Potass. Iodid.* (F. 5).

NEURALGIA.

(a) Facial—*Quin. Sulph.* 5 grs., suspended in milk administered before expected attack; or (F. 75) *Quin. Sulph.* in acid solution.

Liq. Arsenicalis (F. 4).

Butyl-Chloral Hydrate, 5-grain doses.

Hypodermic injection of *Morphinæ Acetas*; *Ungt. Veratrinæ* or *Ungt. Aconitinæ*.

Mineral Spas.—*Altwasser*, *Bonnes*, *Eaux-Chaudes*, *Ischl*, *Schwalbach*.

(b) Lumbago—Hot local applications, Turkish bath.

If severe, local hypodermic injection of *Morphia*, or *Lin. Op.*, *Lin. Chlorof.*, *Lin. Camph.* (F. 57h).

Mineral Spas.—*Buxton*, *Franzensbad*, *Strathpeffer*, *Teplitz*, *Woodhall*, *Homburg*.

(c) SCIATICA.

Local injection of Morphia best.

If syphilitic, Potass. Iodid. (F. 5).

Hot and cold sprays over affected parts.

Small blisters following course of nerve.

Large doses Potass. Iodid., 15 to 120 gra. daily.

Confect. Terebinth., teaspoonful dose.

Strychnine and Nitric Acid (F. 80).

Turkish Baths.

Last resort—Stretching of nerve.

Mineral Spas.—Teplitz, Wildbad, Ischl, Buxton, Bath.

PARALYSIS.

(a) General Paralysis of Insane—

Treatment only palliative.

(b) Hemiplegia—

At first—Complete Rest.

Three weeks after attack—Phosphorus and Strychnine (F. 80, 85, 86).

Constant current.

Daily friction over paralysed muscles, with flexion and extension of the same.

(c) Paraplegia—

If evidence of congestion—Ergot and Bellad. (F. 71a, 15a).

If of malnutrition—Strychnine and Phosphorus (F. 80, 85).

(d) "Bell's Paralysis"—

Persistent use of constant current.

Strychnine (F. 80).

If syphilitic—Potass. Iodid. and Hydrarg. Perchlor. (F. 1).

(e) Writer's Cramp—

Rest if possible. In writing, pencil or soft quill pen, so that any violent grasp becomes impossible.

Steady manipulation by friction of muscles.

Induced and weak galvanic current.

(f) Infantile Paralysis—

Ergot, Fluid Extract, 10 drops thrice daily in early stages.

Constant current and local friction.

If the stage of atrophy is reached, *no* Ergot, but Strychnine may be tried (F. 80).

In various forms of Paralysis, not far advanced—

Mineral Spas.—Baden-Baden, Bath, Bagnères-de-Bigorre, Gastein, Johannsberg, Oeyenhausen, Plombières, Teplitz, Wildbad, Woodhall.

PERICARDITIS.

Large blisters chiefly relied on, covering whole cardiac surface.

Ice-bag, if local pain severe (1 to 3 hours at a time).

Digitalis in small doses if heart's action rapid.
 Subcutaneous injection of Morph. Acetas if great pain.
 For Insomnia, Chloral in doses of gr. xx.
 Depression met by Wine, Brandy, Quinine.
 If effusion has resulted—

Pil. Hydrarg., Digitalis, Scillæ (F. 36).

Last resource—Paracentesis—situation fifth intercostal space to the left of the sternum; avoid wounding internal mammary artery.

Repeated punctures better than withdrawal of all the fluid at once.

Other treatment, in young and vigorous subjects, is twenty or thirty leeches, followed by a Saline Aperient.

Application of a warm poultice.

Hydrarg. Subchlor. gr. ss., Pulv. Antimonialis gr. i.

One such powder every hour, until slight salivation is produced.

PHTHISIS.

Cod-Liver Oil (Ol. Morrhuæ Emulsio, F. 65*d*).

Calcis Hypophosphis c. Glycerino (F. 82).

et Syrupus (F. 82*a*).

Inhalations—

Ol. Lupuli et Ol. Pini Sylvest. (F. 52, 54).

Creasoti vapor (F. 53).

Vapor Iodi.

Hæmorrhage—

Inject. Ergotini Hypodermica, 10 to 12 drops.

Acid. Sulph. Dil., Tinct. Opii (F. 116).

Night perspiration—

Atropine $\frac{1}{16}$ gr., by hypodermic injection at night.

Diarrhœa—

Hazeline, 30 drops every three hours.

Chlorodyne, 25 drops after every motion.

Mist. Cretæ (F. 17, 18).

Counter-Irritants—

Lin. Croton., Lin. Iodi, over affected part of lung.

Diet—

Cod-Liver Oil most useful, cream comes next.

Alcohol, as rum, with milk in the morning.

Climate—

Change of climate. *Warm Climates*—Meran, Pau, Hyères, Nice, Cannes, Pisa.

High Altitudes—Davos-Platz, Andermatt, Wiesen, Maloja. Sea Voyages.

Grape cure—Meran, Vevey.

PHTHISIS (acute).

Iced cloths to abdomen.

Sulph. Quininæ, large doses.

Niemeyer's Pill—Quin. Sulph. 1 gr., Pulv. Opii et Pulv. Digital. aa $\frac{1}{4}$ gr., Fiat Pil. One thrice daily.
Nourishing diet ; stimulants at stated intervals.

PLEURISY (acute).

Early friction stage—leeches, hot poultices or fomentations.
Tinct. Aconiti 1 m. every half-hour for twenty-four hours ; afterwards—
Tolu, Ammoniacum, and Opium (F. 43).
Controlling movements of sides by sticking plaster.
For absorption of effusion—
Pil. Hydrarg., Scillæ et Digitalis (F. 36) until salivation commenced, then Potass. Iodid. (F. 5).
Small blisters, Unguent. Iodi.
Diet—Nourishing, with wine.
Paracentesis, if effusion purulent.
" " serous (see page 218).
Daily compression of the sound side has lately been recommended, as it throws the work upon the diseased lung and so favours absorption.

PLEURISY (chronic).

If absorbents fail, paracentesis.
Risk of position of puncture.
Quantity to be taken, see page 218.
Health-Resorts.—Andermatt, Davos-Platz, Meran, Montreux, Wiesen.

PNEUMONIA (acute lobar).

Early stage, that of Crepitation—I recommend the following :—

12 leeches, followed by fomentations.
Vin. Antimon. \mathfrak{zss} ., Sp. Chloroform. \mathfrak{ziii} ., Aq. Camph. ad \mathfrak{zvi} . M.
A tablespoonful every two hours for twenty-four to forty-eight hours ; when temperature lowered, same mixture every four hours for two days.
Then—Ammonia and Quinine (F. 76).
Quinine (F. 75).

In second stage, that of resolution, my plan is :—

Not to use Antimony, but tonic treatment from first.

Other forms of treatment—

Cold applications to chest, either by ice-bags or evaporating lotions.

Large doses of Quinine, gr. x. to gr. xv., with $\frac{1}{4}$ gr. of Morph. Hydrochlor. once or twice repeated during twenty-four hours.

Then, after twenty-four hours, Quinine in 5 gr. doses every four hours without Morphia.

Tinct. Aconiti, 1 m. every hour for twenty-four hours in early crepitation stage.

Ol. Terebinth. et Ammon. Carb. et Inf. Serpent.

In convalescence with great expectoration—

Inf. Senegæ.

Local applications.—Emplast. Canthar., question of, p. 199.

PNEUMONIA, CATARRHAL, of Young or Aged.

Uniform moist atmosphere of 60° to 70° Fahr. Baths 77° to 86° Fahr., followed by cold affusion.

Ipecacuanha, Tolu, and Acacia (F. 45), or Ammonia, Squills and Senega (F. 44).

PURPURA (Simplex).

Acid. Sulph. Dil. m., x. with $\frac{1}{2}$ gr. Quin. Sulph. every two hours.

Good diet, with wine.

PURPURA (Hæmorrhagica).

Tinct. Ferri Perchlor. (F. 78).

If Internal Hæmorrhage, Ol. Terebinth. or Creasote (F. 11a).

Horizontal position.

RHEUMATISM (Acute).

Salicinum, xxv. grs. every 2 hours in milk until temperature lowered; then, after 48 hours, xx. grs. every 4 hours for 2 days; then xx. grs. every 4 hours for 6 days.

Afterwards Tonics, or Salicylicas Sodii (F. 87).

RHEUMATISM (Chronic).

Potass. Iodid., Inf. Calumb. (F. 5). Guaiacum Mixture (F. 6).

Various Liniments:—

Chloroform, Belladon., Opium (F. 57h). Aconite and Iodine (F. 63).

Lin. Sap. Co. Menthol Cones. Ungt. Veratrinæ.

Mineral Spas—*Thermal Sulphur Spas*.—Aix-la-Chapelle, Aix-les-Bains, Eaux Chaudes.

RHEUMATISM (Chronic, with exudation, etc.) round joints.

Thermal Spas.—Bath, Baden-Baden, Teplitz, Wiesbaden, Wildbad.

Cold Sulphur Spas.—Strathpeffer, Moffat, Buxton, Harrogate, Woodhall.

SCARLET FEVER.

1. Febrifuge Mixture (F. 31).

2. Alterative Powder (F. 8).

3. Tinct. Aconiti, if inflammation great, 1 m. dose.

4. Chlorate of Potassium drink (60 grs. in a pint of water) *ad libitum*.

5. Potass. Chloras, with Glycerine.
 6. Ammon. Carbon., in late stages.
 7. Antipyretics; when fever high—Quinine (F. 75), or Antipyrin (F. 11*k*).
 8. Fat or Oil as an inunction.
- Secondary Nephritis following Fever.
 Application of Leeches. Poulitices.
 Diuretics, Potass. Bitart. (F. 39), preceded by quickly acting Purgative (F. 23).
 Diet—milk, beef-tea, soup.
 Clothing—flannel during desquamation.
 Stimulants.

SKIN, DISEASES OF.

- Arsenic, Alkalies, Potass. Iodid., Iron, Quinine, Cod-liver Oil, Hydrarg. Perchlor.
- Lotions—Lead and Glycerine (F. 57*a*), Soda and Glycerine (F. 57), Prussic Acid (F. 55*a*).
- Ointments—Lead and Vaseline (F. 59), Oxide of Zinc and Camphor (F. 59*a*), Bismuth, Zinc, and Prussic Acid (Fig. 61), Tar and Mercury (F. 64*b*), Citrine Ointment (F. 65*b*), Oleate of Mercury (F. 61, 65*c*).
- Mineral Spas.*—Baden, Bex, Bourboule-les-Bains, Caunteret, Hall, Harrogate, Homburg, Ischl, Krankenheil Tölz, Kreuznach, La Bourboule, Mont-Dore, Schlangenbad, Soden, Vals, Woodhall.

URTICARIA (Chronic)—Harrogate, Moffat, Strathpeffer, Vals.

SLEEPLESSNESS.

As a symptom of mental annoyance—
 Potass. Bromid. (F. 69).

If due to alcohol—

Pot. Bromid., Syr. Chloral (F. 69).

Position in bed.—Head high, warmth to stomach, warmth to feet. Attention to these things lessens the cerebral circulation, and this anæmia of the brain is an essential condition for sleep.

When absolutely necessary, Tinct. Opii with Vin. Antimon. (F. 70).

In Slight Cases.

Injections of Morphia, or Morphia suppositories.

Tinct. Digitalis 15 m. at night.

Or, Tinct. Lupuli ʒss., and lettuce for supper.

Weak whisky and hot water for aged.

Mineral Spas.—Franzensbad, Ems, Homburg.

SMALL-POX.

Early incubation stage (papular)—Saline aperient (F. 24),
Diaphoretics (F. 31).

During pustular stages, Salicylic Acid, Sod. Bicarb., and
Ammon. Carb. (F. 6b).

At a later period in the pustular stage—Ferri et Ammon.
Cit. (F. 6c).

Local Applications, Prick Pustules on Face.

Apply Acid. Carbol. and Glycerine (F. 56a).

Or Acid. Carbolic., Glycerine, Gelatine, and water (F. 6c).

Warm alkaline baths.

In Secondary Stage.

Bromide of Potassium and Hydrate of Chloral (F. 69).

Beef-tea and nourishing diet.

Gloves worn to prevent scratching.

STOMACH (Ulcer of).

Bismuth. Subnit. gr. v., Sod. Bicarb. gr. iv., Pulv. Opii gr. ʒ.
twice daily.

Liq. Bismuthi, Acid. Hydrocyan. Dil., in mixture (F. 9).
Mist. Creasoti.

Carlsbad salt in early morning—to correct acidity, dislodge
gases, and act as a gentle aperient. Dose, ʒi.

Most reliance placed on complete rest to the stomach, the
strength being sustained by nutrient enemata (see text).

SYPHILIS.

1. Inunction of Unguent. Hydrarg. every night.

2. Hypodermic injection of Perchloride of Mercury.

Mode of preparation, see page 85.

3. Fumigation, 8 to 10 grs. of Calomel sublimed by heat,
deposited on skin of patient.

4. Internal administration of Hydrarg. ʒ. Cret., ii. to iii. grs.
twice daily.

Pil. Hydrarg. Subchlor. Co. (Plummer's Pill) twice daily.

Perchloride of Mercury combined with Potass. Iodid. (F. 1).
in the form of Pill with Ext. Gen-

tianæ (Fig. 2).

Zittmann's Decoction (F. 8b).

Mineral Spas.—Aix-la-Chapelle, Aix-les-Bains, Neuenahr,
Kreuznach, Vals, Cheltenham, Harrogate.

VOMITING.

Liq. Bismuthi, Acid. Hydrocyan. Dil. (F. 9).

Creasote, Tinct. Camph. Co., Sp. Chloroform. (F. 11a).

Creasote 1 m., and Pulv. Opii gr. ʒ as a pill.

Occasional doses of Hydrarg. c. Cretâ.

Sea Sickness—

Iced Champagne, Mist. Potass. Bromid. (F. 70a).

Nitrite of Amyl Capsules.

Tight bandage round abdomen.

Horizontal position at first, afterwards steady exercise.

Vomiting of Pregnancy—

Vini Ipecac. in 1 m. dose, with \mathfrak{z} l. of water, hourly.

Oxalate of Cerium, 2 grs.

Pulsatillæ Pulv. 2 grs.

Iced Water.

Mineral Spas.—Homburg (Ludwig), Vichy.

WHOOPIING-COUGH (Pertussis).

Belladonna in increasing doses (Fuller's cure) (F. 15a).

Nitric Acid (F. 15) (Dr. Gibb's cure).

Bromide of Potassium Mixture (F. 70a), or with Chloral (F. 69).

Dilute Hydrobromic Acid given occasionally during the day.

Inhalation of Chloroform in convulsive stages.

Dilute Hydrocyanic Acid in later stages (F. 9, 13).

Apomorphia as an emetic.

Vin. Ipecac. as an emetic.

Locally, Roche's Embrocation.

Nitrate of Silver Solution (2 gr. to \mathfrak{z} l).

Carbolic Acid Inhalation (F. 53a).

Niemeyer's Coercive Cure, see text, p. 172.

Outdoor Treatment, see text, p. 172.

WORMS.*Tape-Worms.*

Inf. Cusso, Ol. Terebinth.

Ext. Filicis Liq. on an empty stomach (F. 29).

Followed by full meal of mashed potatoes in the morning.

Detection of parasite's head is the only certain test of its death.

Lumbrici (Round Worms).

Santonin.—grs. ii. to iii., or (F. 30).

Ol. Terebinth. m. x., repeated.

Thread Worms.

For children—

Enemata of cold water, Inf. Quassia, or cold tea.

Occasional doses of Hydrarg. \bar{c} . Cret.

For adults—

Tinct. Ferri Perchlor. \mathfrak{z} ss. to 1 pint of water as an enema.

PRESCRIPTIONS.

To aid the student in writing out prescriptions in full Latin, some of them are given in the text unabbreviated. By practising the rewriting of these, the student will become more familiar with and be more correct in prescribing than by any rules learned by routine or any examples forced on the memory.

Still, the leading principles to be followed in making a prescription should be acquired, and, as guides in this direction, the following facts may be remembered :—

1. Every prescription commences with *R*—*recipe*—take thou, the second person singular, imperative mood, of the verb *recipio* -i -eptum -ēre.

2. *Recipe*, being an active transitive verb, governs the accusative case ; hence, the quantity of the drug to be weighed is placed in the accusative. Thus—

If in Grains	= granum	gen. -i, acc. plur. grana.
„ Minims	= minimum	gen. -i, „ minima.
„ Drachms	= drachma	gen. -æ, „ drachmas.
„ Ounces	= uncia	gen. -æ, „ uncias.

3. The medicines prescribed are placed in the genitive case, being governed by the quantity of medicine ordered. Thus—

Extractum Colocynthis	= Extracti Colocynthis.
Pilula Hydrargyri	= Pilulæ Hydrargyri.
Sulphas Magnesiae	= Sulphatis Magnesiae.
Vinum Ipecacuanhae	= Vini Ipecacuanhae.
Tinctura Camphoræ Composita	= Tincturæ Camphoræ Compositæ.

4. Each medicine prescribed should have a separate line, and to this *recipe* is understood.

5. At the end of the prescription *misce* is placed, being the second person singular, imperative mood, of

Misceo -i -xtum -ēre,

or, if a solution is wanted,

Solve may be employed, the second person singular, imperative mood, of

Solveo -i -utum -ēre.

6. Directions are generally written in English.

7. The initials of the prescriber follow the prescriptions
Thus—

C.D. R.O. J.W. A.H.

8. The abbreviations sanctioned by usage are

R = Recipe.
Gr. = Granum.
m. = Minimum.
℥ = Drachma.
℥ = Uncia.
M. = Misce.
S. = Solve.

9. The numerals employed representing the exact quantities are the declinable adjectives.

Unus -a -um.
Duo duæ duo.
Tres tres tria.

Or, indeclinable, as

Decem.
Viginti.
Triginta.
Quadraginta.

10. *Semis* expresses the half, and the symbol is *ss.*; occurring alone after a symbol of quantity it is translated *dimidius -a -um*, e.g. ℥ss. = *drachmam dimidiam*; along with another (entire) number, it is translated *cum semisse*, e.g. ℥iiss. = *drachmam cum semisse*.

11. The last line in the prescription has occasioned considerable difference of opinion, bearing upon the question of how "water" should be rendered in Latin. In order to have a fair and unbiassed opinion by a competent authority, I asked a well-known classical scholar to decide on the contending views—whether "Aquam" or "Aquæ" was correct in a prescription having five ounces of water. His answer is as follows:—

"Either form of Latin which you give for "water" would be equally correct, but there would be a difference of meaning. If you wish to state exactly the quantity of water, you would say 'Aquæ uncias quinque.' If you wish only to give the APPROXIMATE quantity—a quantity not to be exceeded—you would say 'aquam (or rather 'aquæ') ad uncias quinque.' In the latter case, I do not mean that 'aquam' would be incorrect, but 'aquæ' would be neater, and more in accordance with usage, i.e. 'up to five ounces of water.'"

This decision, I think, cannot be controverted, and it is to be hoped that "aquam," the inelegance of which is demonstrated, will not disfigure text-books intended for the guidance of medical students.

The doses in the following prescriptions are intended for adults, and it is well for the student to remember that, if used for children, the dose must be proportionate to the age. We calculate the proportion from the rule—divide the age (in years) by the age *plus* 12, and we have the fraction of the adult dose suitable for the case.

Thus, for a child of two years, it will be $\frac{2}{2+12} = \frac{2}{14} = \frac{1}{7}$, making the dose $\frac{1}{7}$ th of that of an adult.

If for a child of three years, $\frac{3}{3+12} = \frac{3}{15} = \frac{1}{5}$ ths, or $\frac{1}{5}$ th, etc.

Opium and its preparations act powerfully on children, and hence the dose must be reduced to a greater extent.

*Principal Preparations containing Opium, Mercury,
Arsenic, etc., with the proportions.*

Tinct. Opii contains gr. i. in min. xivss.
Tinct. Camph. Co. contains gr. i. in ℥ss.
Pil. Plumbi c. Opio contains gr. i. in gr. viij.
Pulv. Ipecac. Co. contains gr. i. in gr. x.
Pulv. Kino Co. contains gr. i. in gr. xx.
Enema Opii contains min. xv. Tinct. (or gr. i.) in ℥j.
Liniment. Opii contains equal parts of Tinct. Opii and
Soap Liniment.
Morphinæ Acet. Liquor. }
Morphinæ Hydrochlor. Liq. } Strength, 1 in 100.
Inject. Morphinæ Hypodermica contains gr. i. in min. x.
Morphinæ Bimeconatis Liquor, gr. vss. in one fluid ounce.

MERCURY.

Hydrarg. c. Cretâ contains gr. i. in gr. iiij.
Pil. Hydrarg. contains gr. i. in gr. iii.
Liq. Hydrarg. Perchlor. contains gr. $\frac{1}{4}$ in ℥i. (gr. ss. in ℥i.)

ARSENIC.

(Fowler's Solution.)

Liquor Arsenicalis }
Liquor Sodii Arseniat. } Strength,
Liquor Arsenici Hydrochlor. } 1 in 100.
Liquor Arsenii et Hydrargyri Iodidi (Donovan's Solution)
contains about 1 per cent by weight of each iodide.

STRYCHNINE.

Liquor Strychninæ Hydrochloratis, strength, 1 in 100.

I.—ALTERATIVES AND RESOLVENTS.

Mercury and Iodide of Potassium.

1. R̄ Hydrarg. Perchlor. gr. i., Potass. Iodid. ℥ij., Decoct. Sarsæ Co. ℥vj. S. et M.—A tablespoonful thrice daily after food.

Mercury and Gentian.

2. R̄ Hydrarg. Perchlor. gr. i., Ext. Gentian. ℥ss. M.—Divide into twelve pills; one thrice daily.
Useful in secondary syphilis.

Donovan's Triple Solution.

3. R̄ Liquoris Arsenii et Hydrargyri Iodid. ℥ij., Tinct. Zingib. ℥ij., Aquæ ad ℥vj. M.—A tablespoonful thrice daily after food.
Useful in secondary syphilis and some skin eruptions.

Arsenic and Cinchona.

4. R̄ Liquor. Arsenicalis ℥j., Tinct. Cardamom. Co. ℥ij., Decoct. Cinchon. ad ℥vj. M.—A tablespoonful thrice daily after food.
Useful in various skin affections, chorea, chronic cerebral congestion.

Iodide of Potassium and Calumba.

5. R̄ Potass. Iodid. ℥ij., Infus. Calumbæ ℥vj. S.—A dessert-spoonful thrice daily.
Useful in various diseases, syphilitic or otherwise.

Guaiacum Mixture.

6. R̄ Tinct. Guaiaci Ammon. ℥ij., Tinct. Aconiti m. xx., Mucil. Acac. ℥i., Aquæ Camph. ad ℥vj. M.—Two tablespoonfuls thrice daily.
Recommended in Cynanche tonsillaris and some skin affections.

Guaiacum, Iodide of Potassium, and Colchicum.

- 6a. R̄ Pulv. Guaiaci, Potass. Iodid. āā, gr. x., Tinct. Colchici ℥ss., Aq. Cinnamomi, Syrupi āā q.s. ad ℥i. S. et M.—A dessert-spoonful or a tablespoonful thrice daily.
Useful in chronic rheumatism.

Salicylic Acid in Small-pox.

- 6b. R Acidi Salicylici gr. xx., Sodii Bicarb., Ammon. Carb. āā gr. iv. M.—To be taken in water every two or three hours in the early stage of small-pox; or, in the later stages, with the addition of 5-grain doses of the Citrate of Iron and Ammonia.

Carbolic Acid.

- 6c. R Acidi Carbolici, Glycerini, Gelatinæ āā ℥i., Aquæ ℥xxi. M.—As soon as pustules form, prick them, and apply this lotion. Patient should also take warm bath daily.

Chlorate of Potassium.

7. R Potass. Chlorat. ℥ij., Syrupi Simplicis ℥iij., Aquæ Camph. ad ℥viiij. S. et M.—A tablespoonful every four hours. Recommended in inflammatory affections of the mouth, etc.

Mercury, Rhubarb, and Soda.

8. R Hydrarg. c. Cretā gr. ij., Pulv. Rhei gr. ij., Sodii Bicarb. gr. iij. M.—Make a powder. One at bedtime. Recommended in various infantile or children's diseases.

Condurango Bark.

- 8a. R Cort. Condurango ℥ss., Aquæ ℥xii. Macerate for 12 hours, and then boil down to ℥vi. One to two tablespoonfuls twice daily.

Recommended for cancer of the stomach by Freidreich.

*Zittmann's Decoction (Strong).**Decoctum Zittmanni Fortior.*

- 8b.¹ 420·0, Sarsaparilla Root, with 30 kilogrammes of water, are macerated for 24 hours; then Alum is added 25·0, Calumb. 2·5, Cinnab. 4·5, and the decoction is boiled until 10 kilogrammes result. Anise Seeds 15·0, Senna 100·0, Liquorice Root 50·0, are added, and the whole boiled, pressed, and strained.

Decoctum Zittmanni Mitius.

The root and branches of Sarsaparilla 230·0 and 30 kilogrammes of water are boiled down to 20 kilogrammes; then Cortex Citri, Cassia, Cinnamon, Cardamoms, Liquorice Root, of each 12·0, are added, boiled, and the whole pressed.

Of the strong decoction, a dessert-spoonful may be taken thrice daily. Of the weak decoction, a tablespoonful thrice daily.

Recommended specially by German authorities in constitutional syphilis.

¹ The weights here indicated are in *grammes*.

II.—ANTACIDS.

Bismuth, Hydrocyanic Acid, etc.

9. \mathcal{R} Liq. Bismuthi (Scht.) \mathfrak{zss} ., Acid. Hydrocyan. Dil. m. xl., Tinct. Card. Co. \mathfrak{zij} ., Spt. Chloroform. \mathfrak{ziss} ., Aquæ ad \mathfrak{zvj} . M.—A tablespoonful thrice daily before food. Recommended in dyspepsia, for vomiting and pain in gastric ulcer, and in hooping-cough.

Ammonia, Potash, and Chiretta.

10. \mathcal{R} Ammon. Carb. \mathfrak{zj} ., Potass. Bicarb. \mathfrak{ziss} ., Inf. Chiratae \mathfrak{zvj} . S.—A tablespoonful thrice daily before food. Useful for the acid eructations of dyspepsia and debility.

Magnesia and Soda.

11. \mathcal{R} Magnes. Levis \mathfrak{zss} ., Sodii Bicarb. gr. xx., Tinct. Aurantii \mathfrak{zss} ., Aquæ Menth. Pip. \mathfrak{zj} . M.—The draught; for heartburn, etc.

Creasote.

- 11a. \mathcal{R} Creasoti m. i., Tinct. Camph. Co. m. 30, Spirit. Chloroform. m. 15, Glycerini \mathfrak{z} l., Aquæ \mathfrak{zj} . In vomiting or heartburn.

ANTI-PYRETICS.

- 11b. \mathcal{R} Liq. Ammon. Acet. \mathfrak{zss} ., Sp. Æth. Nit. \mathfrak{zss} ., Tinct. Hyoscyam. \mathfrak{ziii} ., Aquæ Camphoræ ad \mathfrak{zvi} . M.—A tablespoonful every two hours.

Used as an antipyretic at the commencement of Febricula.

- 11c. \mathcal{R} Sulphatis Quininæ gr. xxx.

Suspended in milk, this powder is sometimes ordered to reduce temperature in typhoid fever.

Injectio Sulphatis Quininæ.

- 11d. \mathcal{R} Quininæ Sulphatis gr. xxx., Acidi Tartarici gr. xv., Aquæ \mathfrak{zss} . 20 drops as a hypodermic injection contain 3 grains of Sulphate of Quinine. This injection causes no abscesses, and is useful in fever.

Salicin.

- 11e. \mathcal{R} Salicini gr. xxv. One powder in milk every two hours in acute rheumatism.

Salicylic Acid Mixture.

- 11f. *R* Acidi Salicylici drachmas duas, Potassii Acetatis drachmas quatuor cum semisse, Aquæ uncias sex. Solve.—A tablespoonful every three hours.

Given by some in acute rheumatism, but greatly inferior to Salicin unless directly prepared from that powder.

NON-OFFICIAL ANTIPYRETICS.

- 11g. *Chinolini Tartras*.—Dose, gr. vii.-xv.
- 11h. *Kairin*.—Dose, 5 to 8 grains every hour or hour and a half. 8 grains recommended every hour at first for four hours, or until the temperature has fallen to 100° F.; after the temperature reaches 100° F., 4 grains should be given hourly until the temperature begins to rise, when the dose should be increased. If the fever resist reduction in four hours in the doses mentioned, 12 to 16 grains are recommended hourly until the temperature reaches 100° F., when the dose should be lowered.
- 11k. *Antipyrin*.—Dose, 30 grains hourly for three hours. For children, a grain and a half for every year of the child's age may be given hourly for three hours.
- 11l. *Resorcin*.—Dose, 15 to 30 grains, given with simple Elixirs freely diluted. Rarely administered internally, as it is apt to produce toxic effects.

III.—ANTISPASMODICS.

Lobelia, Ether.

12. *R* Tinct. Lobel. ʒij., Spt. Æther. ʒij., Tinct. Conii ʒij., Mist. Ammoniaci ad ʒvj. M.—A tablespoonful every three hours.

In asthma and paroxysmal coughs.

Cardamoms and Ammonia.

13. *R* Tinct. Card. Co. ʒiv., Acid. Hydrocyan. Dil. m. xl., Spt. Ammon. Aromat. ʒij., Tinct. Zingib. ʒij., Spt. Chloroform. ʒij., Aquæ Carui ad ʒvj. M.—A tablespoonful to be taken occasionally.

For Flatulence or colic.

Valerian and Asafetida.

14. *R* Tinct. Valerian., Tinct. Asafet. aa ʒij., Tinct. Lavand. Co. ʒiss., Aquæ ad ʒvj. M.—A tablespoonful every three hours. For hysteria, etc.

Chloral, Bromide of Potassium, and Morphia.

- 14a. \mathcal{R} Chloral Hydratis, Potass. Bromid., Potass. Bicarb.,
 āā \mathfrak{z} i., Liq. Morph. Hydrochlor. \mathfrak{z} i., Aquæ \mathfrak{z} v. S. et
 M.—A small tablespoonful every three hours.

Gibb's Nitric Acid Mixture.

15. \mathcal{R} Acid. Nitric. Dil. \mathfrak{z} xii., Tinct. Card. Co. \mathfrak{z} ijj., Syrup.
 Simplicis \mathfrak{z} iiiss., Aquæ \mathfrak{z} j. M.—A small teaspoonful
 every two hours.
 For hooping-cough.

Dr. Fuller's Belladonna Mixture.

- 15a. \mathcal{R} Zinc. Sulphat. gr. viii., Ext. Belladon. gr. vii., Aq. \mathfrak{z} iv.
 S.—A teaspoonful four times daily, and increased by
 one dose daily to a child above three years old.

Mistura Belladonnæ (Dr. Fuller's).

- 15b. Recipe—Zinci Sulphatis grana octo, Extracti Belladonnæ
 grana septem, Aquæ ad uncias quatuor. Misce.
 Signa—A teaspoonful four times a day, and increased by
 one dose daily to a child above three years old.

IV.—ASTRINGENTS.

Sulphuric Acid and Opium.

16. \mathcal{R} Acid. Sulph. Dil. \mathfrak{z} iiiss., Tinct. Opii \mathfrak{z} j., Spt. Chloroform.
 \mathfrak{z} ij., Aquæ Menth. Pip. ad \mathfrak{z} vj. M.—A tablespoonful
 after every liquid stool; or a tablespoonful every two
 hours in hæmoptysis.
 For diarrhœa and hæmoptysis in adults.

Acidum Sulphuricum Dilutum cum Tincturâ Opii.

16. Recipe—Acidi Sulphurici Diluti drachmas duas cum
 semisse, Tincturæ Opii drachmam, Spiritûs Chloro-
 formi drachmas duas, Aquæ Menthæ Piperitæ ad uncias
 sex. Misce.
 Signa—A tablespoonful after every liquid stool in diarrhœa.

Catechu, Opium, and Chalk.

17. \mathcal{R} Tinct. Catechu \mathfrak{z} ijj., Tinct. Opii \mathfrak{z} j., Pulv. Cinnam. Co.
 \mathfrak{z} iss., Mist. Cretæ ad \mathfrak{z} vj. M.—A tablespoonful after
 every liquid stool; for adults.
 For excessive diarrhœa of typhoid fever.

Chalk-Mixture, Cinnamon, and Opium.

18. R Tinct. Opii m. x., Pulv. Cinnam. Co. ʒj., Mist. Cretæ ʒvi., Aquæ Cinnamomi ad ʒiv. M.—A teaspoonful may be given every hour.

For diarrhœa of children, and in chronic dysentery.

"Mistura Cretæ et Cinnamomi et Opii."

18. Recipe—Tincturæ Opii minima decem, Pulveris Cinnamomi Compositi drachmam, Misturæ Cretæ drachmas sex, Aquæ Cinnamomi ad uncias sex. Misce.

Signa—A teaspoonful may be given every hour.

For diarrhœa of children.

- 18a. R Ol. Anisi, Ol. Cajuputi, Ol. Juniperi, aa ʒss., Æther. ʒss., Liq. Acid. Halleri ʒss.,¹ Tinct. Cinnamom. ʒii. M.—Ten drops every quarter of an hour in a little water. An opiate may be given with the first and second dose. Used to promote reaction in cholera and diarrhœa.

Gallic Acid.

19. R Acid. Gallici gr. x., Aquæ ʒiss. S.—To be taken every four hours.

Useful in hæmoptysis and various hæmorrhages, and in chronic dysentery.

19. Recipe—Acidi Gallici grana decem, Aquæ unciam cum semisse. Solve.

Signa—To be taken every four hours.

Useful in hæmoptysis and various hæmorrhages and in chronic dysentery.

Lead and Opium.

- 19a. R Pil. Plumb. cum Opio (gr. v.) xii. Sig.—One after every stool in diarrhœa of typhoid fever, if stools exceed four daily.

Bismuth Mixture.

20. R Bismuth. Subnitrat. ʒj., Mucilag. Acaciæ ʒvj. M.—A. tablespoonful every three hours.

Useful in diarrhœa of phthisis.

Cascarilla, Squills, and Dilute Sulphuric Acid.

21. R Tinct. Scillæ ʒiss., Acid. Sulph. dil. ʒiss., Tinct. Opii ʒss., Inf. Cascarillæ ad ʒvj. M.—A tablespoonful every three hours.

Useful in chronic bronchitis, to check excessive expectoration.

¹ Liquor Halleri consists of one part of concentrated sulphuric acid to three parts of rectified spirit.

Cascarilla et Scilla et Acidum Sulphuricum Dilutum.

21. Recipe—Tincturæ Scillæ drachmam cum semisse, Acidi Sulphurici diluti drachmam cum semisse, Tincturæ Opii drachmam dimidiam (vel semidrachmam), Infusi Cascarillæ ad uncias sex. Misce.

Signa—A tablespoonful every three hours.

Useful in chronic bronchitis, to check excessive expectoration.

Starch and Laudanum Enema.

22. R Tinct. Opii ʒss., Ol. Terebinth. m. x., Mucilag. Amyli ʒii. M.

May be employed to check the diarrhœa of typhoid fever, when excessive.

V.—CATHARTICS AND ANTHELMINTICS.

Calomel and Jalap.

23. R Hydrarg. Subchlor. gr. v., Pulv. Jalapæ gr. xv. M.
An active purgative.

23. Recipe—Hydrargyri subchloridi grana quinque, Pulveris Jalapæ grana quindecim. M.
An active purgative.

Pulvis Alterans Plummeri (Plummer's Alterative Powder).

- 23a. In the German Pharmacopœia is thus prepared—Calomel., Stibii Aurant. Sulf. aa 0·05, Sacch. 0·5.—One to three powders given as an alterative.

Sulphate of Magnesia and Sulphuric Acid.

24. R Magnes. Sulph. ʒij., Acid. Sulph. dil. ʒiss., Tinct. Card. Co. ʒiss., Aquæ Menth. Pip. ad ʒvj. M.—A wine-glassful every half-hour, until bowels act freely.

Aqua Purgativa (Eau Purgative Gazeuse).

- 24a. Crystallised Phosphate of Soda, 40·0, Sod. Bicarb. 5·0, Aq. Destill. 625·0, Acid. Citric. 10·0.—A wine-glassful of this taken before breakfast forms a pleasant draught, and has an aperient action.

Aloes, Ginger, and Jalap.

25. R Tinct. Jalapæ, ʒvi., Syr. Zingib., ʒii., Decoct. Aloes Co. ad ʒvj. M.—An ounce night and morning.
Useful in bilious headache and constipation.

"Tinctura Jalapæ, Syrupus Zingiberis, Decoctum Aloes Compositum."

25. Recipe—Tincturæ Jalapæ drachmas sex, Syrupi Zingiberis uncias duas, Decocti Aloes Compositi ad uncias sex. Misce.

Signa—An ounce in morning. A pleasant cathartic.
Useful for bilious headache and constipation.

Rhubarb, Soda, and Aloes.

26. R Extract. Rhei gr. x., Sodii Phosphat. ʒj., Decoct. Aloes Co. ʒss., Aquæ Menth. Pip. ʒj. M.
A warm aperient, useful in the early stage of gout.

Elaterium and Colocynth.

27. R Elaterii gr. i., Ext. Colocynth. Co. ʒss., Ext. Hyoscyam. gr. xii. Mix, and divide into twelve pills; one night and morning.
Useful in cardiac or other forms of dropsy.

Elaterinum et Colocynthis.

27. Recipe—Elaterii granum, Extracti Colocynthidis Compositi grana triginta, Extracti Hyoscyami grana duodecim. Misce.—Divide into twelve pills; one night and morning. Hydragogue cathartic.
Useful in cardiac or other forms of dropsy.

Mercury and Podophyllin.

- 27a. R Resinæ Podophylli gr. i., Pil. Hydrarg. gr. iii., Ext. Colocynth. Co. gr. iii., Ext. Hyoscyam, gr. iii. M.—Divide into two pills; one at bedtime.

Antimony, Sulphate of Magnesia, and Citrate of Ammonia.

28. R Vin. Antimon. ʒj., Magnes. Sulphat. ʒss., Liquor. Ammon. Citrat. ʒiss., Aquæ ad ʒvj. M.—Two table-spoonfuls twice or thrice daily.
Useful as an aperient in the early stages of various disorders.

Aloes, Nux Vomica, and Gentian.

- 28a. R Ext. Aloes Socotr. gr. i., Ext. Nuc. Vomica. gr. ʒ, Ext. Gentian. gr. i. M.—An after-dinner pill in constipation.

Filix-Mas.

29. R Extracti Filicis Liquidi m. xxx., Pulv. Gum. Acaciæ ʒi., Aquæ Menth. Pip. ʒj.—Make an emulsion.
Considered a specific in tapeworm.

"*Felix-Mas, Pulvis Gummi Acaciæ, Aqua Menthæ Piperitæ.*"

29. Recipe—Extracti Filicis Liquidi minima triginta, Pulveris Gummi Acaciæ drachmam, Aquæ Menthæ Piperitæ unciam. Misce.—Make an emulsion.

Signa—To be taken on an empty stomach.

Considered a specific for tapeworm.

Felix-Mas (Anthelmintic).

- 29a. Æth. Extr. Fil. Maris 1·5, with powder of root of Male-fern, 2·0.—Early in the morning or in the evening at 10 P.M., followed by a purgative.

Elect. Anthelminticum (Male-fern Root).

- 29b. Root of Male-fern, Valerian Flowers, Sulphate of Potash, of each 2·5, Aq. Dest. sweetened with honey, 30·0.—In tape-worm this draught to be taken in the evening, followed by a purgative.

30. R. Santonini gr. ij., Pulv. Scammon. gr. iij. M.—Ft. Pulv. Very effectual in expelling the round-worm or thread-worm in children.

VI.—DIAPHORETICS.

Acetate of Ammonia and Nitrous Ether.

31. R. Liquor. Ammon. Acetat. ℥j., Spt. Æther. Nitrosi ℥ss., Tinct. Hyoscyam. ℥iij., Aquæ Camph. ad ℥vj. M.—A tablespoonful every three hours.

Useful in febricular and some inflammatory disorders.

Acetatis Ammonii Liquor cum Spiritu Ætheris Nitrosi.

31. Recipe—Liquoris Ammonii Acetatis unciam, Spiritus Ætheris Nitrosi unciam dimidiam, Tincturæ Hyoscyami drachmas tres, Aquæ Camphoræ ad uncias sex. Misce.

Signa—A tablespoonful every three hours.

Useful in febricular and early stages of inflammatory diseases.

Dover's Powder and Antimony.

32. R. Pulv. Ipecacuanhæ Comp. gr. vj., Antimon. Tartarat. gr. 4. M.—One powder every six hours.

Pulvis Guaiaci et Nitræ Potassii.

33. Recipe—Pulveris Guaiaci grana triginta.
Potassii Nitratis grana quindecim.

Misce.

Signa—To be taken at bedtime (some warm gruel to be taken afterwards).

Useful in chronic rheumatism.

Ipecacuanha and Citrate of Ammonium.

34. R Vini Ipecac. ℥ss., Syrupi ℥ss., Tinct. Camph. Co. ℥ij., Liquor. Ammon. Citrat. ℥ss., Aquæ ad ℥ij. M.—A teaspoonful every two hours.

Useful in catarrhal and febrile affections of children.

Pilocarpinæ Hydrochloras et Pepsina et Acidum Hydrochloricum.

- 34a. Recipe—Pilocarpinæ Hydrochloratis semi-granum.

Pepsinæ grana decem.

Acidi Hydrochlorici guttas duas.

Aquæ destillatæ uncias duas.

Misce.

A teaspoonful hourly has been recommended for children in diphtheria.

- 34b. R Pilocarpin. Nitratis $\frac{1}{4}$ gr., Aquæ m. x. M.—In Bright's disease, as a subcutaneous injection.

VII.—DIURETICS.

Squill, Broom, and Acetate of Ammonium.

35. R Tinct. Scillæ ℥ij., Liq. Ammon. Acetat. ℥ij., Decoct. Scoparii ad ℥vj. M.—Two tablespoonfuls thrice daily.

Useful in dropsy dependent on disease of the heart, liver, etc.

Hydrargyrum et Scilla et Digitalis (Guy's Pill).

36. Recipe—Pilulæ Hydrargyri grana triginta.

Pulveris Scillæ grana sex.

Pulveris Digitalis grana duodecim.

Misce.

Divide into twelve pills.

Signa—One twice daily.

Useful in pleurisy or pericarditis, to remove effusion.

Acetate of Potassium, Squill, and Digitalis.

37. R Potass. Acetat. ℥ss., Acet. Scillæ ℥ss., Spt. Ætheris Nitrosi m. xx., Tinct. Digitalis m. v., Decoct. Scoparii ℥iss. M.—The draught thrice daily.

Acetas Potassii, Acetum Scillæ, Spiritus Ætheris Nitrosi, Tinctura Digitalis, Decoctum Scoparii.

37. Recipe—Potassii Acetatis grana triginta, Aceti Scillæ minima triginta, Spiritus Ætheris Nitrosi minima viginti, Tincturæ Digitalis minima quinque, Decocti Scoparii unciam cum semisse. Misce.

Signa—The draught thrice daily.

An excellent diuretic in dropsy.

- 7a. \mathcal{R} Potass. Acetat. $\mathfrak{z}\text{ij}$., Potass. Citrat. $\mathfrak{z}\text{ij}$., Inf. Digitalis $\mathfrak{z}\text{vj}$. M.—A tablespoonful every three hours.

Bitartrate of Potassium and Buchu.

38. \mathcal{R} Potass. Bitart. $\mathfrak{z}\text{ij}$., Inf. Buchu $\mathfrak{z}\text{vj}$. M.—Two tablespoonfuls thrice daily.

Useful as a diuretic, and where there is very acid urine with an excessive secretion of uric acid.

Oil of Juniper, Nitrous Ether, and Digitalis.

39. \mathcal{R} Olei Juniperi $\mathfrak{z}\text{ss}$., Spt. \mathcal{A} etheris Nitrosi., Vini Ipecac., Tinct. Digitalis, aa $\mathfrak{z}\text{ij}$. M.—Twenty-five drops every three hours.

Diuretic, and in some cases also useful as an emmenagogue.

Potassii Nitratis et Decoctum Hordei.

40. Recipe—Potassii Nitratis drachmas duas.

Acidi Nitrici diluti drachmam.

Misce.

Signa—To be put into one pint of Decoction of Barley, and drunk daily.

Useful in the early stages of fever as a diuretic.

Vin diuretique de l'Hôtel-Dieu (Trousseau).

40a. White wine (containing 9 to 10 per cent of alcohol)	4000
Alcohol of 90° strength ¹	500
Dried Digitalis leaves	60
Scales of Squill	30
Juniper Berries	300
Dry Acetate of Potassium	200

Divide and crush the Digitalis leaves, Juniper Berries, and the Scales of Squill; macerate them with the White Wine and Alcohol. After maceration for 15 days, agitate them in a closed vessel and press. To the liquid obtained, add the Acetate of Potassium, agitate until the salt is dissolved, and filter. These proportions furnish 4 kilogrammes of medicinal wine, which keeps well, and which, independent of its soluble principles, contains Digitalis, Squill, and Juniper Berries and 1 gramme of Acetate of Potassium in 20 grammes of the liquid.

Dose—Three tablespoonfuls daily.

VIIA.—ELIXIRS.

The United States Pharmacopœia contains one Elixir—Elixir Aurantii, Elixir of Orange, or Simple Elixir.

¹ Alcohol of 90° strength, Centesimal scale, contains 85 % alcohol, 15 % water.

This Elixir forms a convenient vehicle for giving Tinctures and extracts, as it renders a mixture palatable, while not affecting its efficiency.

Elixir Simplex is thus prepared—Spirit of Orange (Oil 1 part, Rect. Sp. 15) $\frac{1}{2}$ ounce, Rectified Spirit $4\frac{1}{2}$ ounces, Distilled Cinnamon Water 6 ounces, Syrup 6 ounces. Mix and filter. Dose, 20 minims to 1 drachm. This quantity may be added to the dose of any liquid medicine, thereby rendering it palatable and efficient.

Elixir Rubrum.—Solution of Carmine 1 drachm, Simple Elixir 1 to 2 ounces. Mix. Dose, 20 minims to 1 drachm. Not compatible with acids, but gives a pleasant taste and imparts a nice colour to other liquid medicines.

Elixir Acidum (Haller's Acid Elixir).—*Synonym*—Liquor Acidus Halleri. Dose, 2 to 8 minims. It is prepared from strong Sulphuric Acid 1 part, Rectified Spirit 3 parts. Mix carefully and gradually.

Given with water in fever and to form agreeable acidulated drinks. Useful in checking excessive perspiration.

Another excellent Elixir is the one mentioned under Bromid. Potass. (F. 70a).

40a. **Elixir Pepsinæ Comp.** is prepared with Pepsine, Sherry, Syrup of Orange, of each 50·0; Tinct. Rhei, Vin. Aromat. et Amar, 10·0. One teaspoonful a dose.

40b. **Elixir Antiasthmaticum.**—Fol. Digital. 5·0, Rad. Glycyrrh. 10·0, Liquor. Sant. Verb. 1·0, Spt. Vini. Rectificat, Aq. Fœniculi $\bar{a}\bar{a}$ 25·0. Dose, 15, 20, 25 drops three or four times daily.

VIII.—EMETICS AND EXPECTORANTS.

Antimonial and Ipecacuan Emetic.

41. \mathcal{R} Antimon. Tartarat. gr. $\frac{1}{2}$, Vin. Ipecac. $\mathfrak{z}\text{j}$., Aquæ ad $\mathfrak{z}\text{iss}$. M.

vel

Antimonium Tartaratum et Vinum Ipecacuanhæ.

41. Recipe—Antimonii Tartaratisemi-granum, Vini Ipecacuanhæ drachmam, Aquæ ad unciam cum semisse. Misce.

An emetic to relieve the stomach in early stages of fever.

42. \mathcal{R} Vin. Ipecac. $\mathfrak{z}\text{j}$.

Either of these draughts will relieve the stomach. They are sometimes recommended in the early stages of fevers, etc.

Tolu, Ammoniacum, and Opium.

43. R Syrupi Tolutani ℥ss., Mist. Ammoniaci ℥ij., Tinct. Camph. Co. ℥iij., Aquæ ad ℥vj. M.—A tablespoonful three times a day.

Useful in chronic bronchitis.

Ammonia, Squills, and Senega.

44. R Ammonii Carbonatis ℥j., Tinct. Scillæ ℥iij., Tinct. Camph. Co. ℥ss., Infus. Senegæ ad ℥vj. M.—A tablespoonful every four hours.

A stimulating expectorant in various chest affections.

Ipecacuanha, Tolu, and Acacia.

45. R Vin. Ipecac. ℥j., Syrup. Tolutani ℥iv., Mucilag. Acaciæ ad ℥ijs. M.—A teaspoonful every hour or every second hour.

Useful in acute bronchitis or measles with chest symptoms, or chest complications in continued fevers.

Ipecacuanha, Tolu, et Acacia.

45. Recipe—Vini Ipecacuanhæ drachmas duas.
Syrupi Tolutani drachmas quatuor.
Mucilaginis Acaciæ unciam cum semisse.

Misce.

Signa—A teaspoonful every hour or every second hour in acute bronchitis, or measles with chest-symptoms.

Lobelia, Spirit of Chloroform, and Conium.

46. R Tinct. Lobeliæ ℥ij., Spt. Chloroform. ℥iij., Tinct. Conii ℥iij., Mist. Amygdalæ ad ℥vj. M.—A tablespoonful three times a day.

Useful in asthma, etc.

IX.—GARGLES AND INHALATIONS.

Tannin Gargle.

47. R Tannin. ℥j., Aquæ Camph. ℥vj. S.—The gargle, to be used frequently.

“Gargarisma Acidi Tannici.”

47. Recipe—Acidi Tannici grana sexaginta, Aquæ Camphoræ uncias sex. Solve.

Signa—The gargle, to be used frequently.

Myrrh and Alum.

48. R̄ Tinct. Myrrhæ, ℥ij., Aluminis ℥j., Infusi Rosæ Acidi ad ℥vj. M.—To be used frequently in mercurial salivation, or scarlatinal or aphthous ulceration of the throat.

Tannin and Glycerine.

49. R̄ Acid. Tannici ℥ss., Glycerini ℥iv. S.—The throat to be touched with this twice or thrice daily in scarlet fever, etc.

Borax and Glycerine.

50. R̄ Sodii Biborat. ℥j., Glycerini ℥ij. S.
Useful in ulceration of mouth and throat.

"Sodæ Biboræ et Glycerinum."

50. Recipe—Sodii Biboratis grana sexaginta, Glycerini uncias duas. Solve.
Signa—Useful in ulceration of mouth and throat.

Nitrate of Potassium.

51. R̄ Potass. Nitrat. ℥j., Aquæ ℥j.—Saturate white blotting paper in this solution, and dry it; cut the paper into pieces 3 inches long and $\frac{1}{2}$ inch broad. One piece may be lighted and the smoke inhaled. One to six papers may be used in succession for each inhalation.
Recommended as an antispasmodic in asthma.

Hop Inhalation.

52. R̄ Ol. Lupuli ℥ss., Magnesiæ Carb. Pond. ℥j., Aquæ ad ℥ij. M.—A teaspoonful to be put into a pint of boiling water, and used by Maw's inhaler.
Useful in phthisis, when cough is irritable, and in various chest affections.

Vapor Olei Lupuli.

52. Recipe—Olei Lupuli minima triginta, Magnesii Carbonatis Ponderosæ grana sexaginta, Aquæ ad uncias tres. Misce.
Signa—A teaspoonful to be put into a pint of boiling water, and used by Maw's inhaler.
Useful in phthisis when the cough is irritable, and in various chest affections.

Creasote Inhalation.

53. R̄ Creasot. ℥ij., Magnes. Carb. Pond. ℥ss., Aquæ ad ℥ij. M.; or,

Carbolic Acid Inhalation.

- 53a. R Acid. Carbolici ℥i., Glycerini ℥i., Aquæ ℥vi. S.—A teaspoonful in a pint of water at 150° F. for each inhalation. Useful in chronic congestion of the larynx, and in whooping cough.

Pine Inhalation.

54. R Ol. Pini Sylvestris ℥ij., Magnes. Carb. Pond. ℥j. Aquæ ad ℥ij. M.—A teaspoonful in a pint of water at 150° F. for each inhalation.

Vapor Olei Pini Sylvestris.

54. Recipe—Olei Pini Sylvestris drachmas duas, Magnesii Carbonatis Ponderosæ drachmam, Aquæ ad uncias tres. Misce.

Signa—A teaspoonful in a pint of water at 150° F. at each inhalation.

Ipecacuanha Spray.

- 54a. Dr. Ringer recommends this in chronic bronchitis, in the form of Vinum Ipecacuanhæ, at first daily, then twice a day. ℥ss. of Vin. Ipecac. diluted with ℥iii. of water is placed in a ball spray apparatus, and, compression being used, the spray is directed into the patient's mouth, while he is told to close his nose with his fingers and breathe deeply. In cold weather, the spray should be warmed. The patient is also directed to rinse out the mouth with water at each pause in the administration, for more wine collects in the mouth than passes into the lungs, and, if swallowed, this might produce nausea and vomiting.

X.—POWDERS, LOTIONS, LINIMENTS, ETC.

Soothing Dusting-Powder.

55. R Pulv. Amyli ℥ii., Zinci Oxidi ℥i., Pulv. Camphoræ ℥i. M. May be used in acute eczema, in erysipelas, or shingles.

"Acidum Hydrocyanicum Dilutum et Hydrargyri Perchloridum."

- 55a. Recipe—Acidi Hydrocyanici diluti minima sexaginta. Hydrargyri Perchloridi grana duo. Misturæ Amygdalæ ad uncias sex.

Misce.

Signa—"For external use." "Poison." Useful in prurigo and various skin affections attended with itching.

Cajuput, Opium, Turpentine, and Ammonia.

- 55b. R Ol. Cajuputi, Tinct. Opii, āā ℥ii., Ol. Terebinth ℥iv.,
Liniment. Ammon. ℥i.

This liniment should be applied in chronic rheumatism
when a stimulating embrocation is indicated.

Prussic Acid and Potash.

56. R Liquoris Potassæ ℥ij., Acid. Hydrocyanici dil. ℥j., Aquæ
ad ℥vj. M.

Useful in pityriasis.

Carbolic Acid and Glycerine.

- 56a. R Acidi Carbolici gr. viij., Glycerini ℥ss., Aquæ ad ℥j. S.
et M.

Applied to pustules in small-pox.

"Sodii Bicarbonas et Glycerinum."

57. Recipe—Sodii Bicarbonatis drachmam.
Glycerini unciam cum semisse.

Solve.

Signa—"The lotion." Useful in the itching of cutaneous
diseases.

Lead and Glycerine Lotion.

- 57a. R Liq. Plumbi Subacetatis ℥i., Glycerini ℥iii., Aquæ
ad ℥vi. M.

Recommended in acute eczema, especially of the face.

Prussic Acid Lotion.

- 57b. R Acid. Hydrocyan. dil. ℥ii., Sodii Bicarb. ℥i., Glycerini
℥vi., Aquæ Rosæ ad ℥vi. M.

Used in acute eczema and for the relief of pruritus.

Oxide of Zinc Lotion.

- 57c. R Zinci Oxidi ℥iv., Glycerini ℥i., Liquor Calcis ℥ii., Aquæ
Rosæ ad ℥vi. M.

Of service in acute eczema and acne rosacea.

Lotion of Potash Soap.

- 57d. R Saponis Mollis, Spt. Vin. Rect. āā ℥i., Aquæ ad ℥iv.
M.—Rub in well night and morning.

Useful in psoriasis, acne, and chronic eczema with much
thickening.

Lotion of Potassa Fusa.

- 57e. R Potass. Fusæ gr. v.-xx., Aquæ ℥i. Solve.—Paint on at night, washing off when smarting becomes severe. Valuable in the later stages of chronic eczema with much thickening.

Sulphur Lotion.

- 57f. R Sulphuris ℥iii., Glycerini ℥iv., Spt. Vin. Rect. ad ℥iv. M.—Rub in at night. Valuable in acne vulgaris.

Carbolic Acid and Glycerine.

- 57g. R Acid. Carbol. pur. ℥ii., Glycerini ℥i. M. Very useful in ringworm of the head; for a child of ten. About half or one-third this strength for a child of three or four.

Liniments of Camphor, Chloroform, and Belladonna.

- 57h. R Linimenti Camphoræ ℥i., Linimenti Chloroformi ℥ss., Linimenti Opii ℥ss. M. In chronic rheumatism, a teaspoonful placed on flannel and rubbed into the affected part.

Corrosive Sublimate Lotion.

58. R Hydrarg. Perchloridi gr. iv., Spt. Vini. Rect. ℥iv., Aquæ ad ℥ii. M.—Rub in night and morning. Used in Tinea of all kinds.

Corrosive Sublimate and Soap.

- 58a. R Hydrarg. Perchlor. gr. viii., Saponis Mollis ℥iiss., Spt. Vini. Rect. ℥iiss. Solve.—To be rubbed in night and morning. Especially useful in tinea versicolor.

Corrosive Sublimate and Sal-Ammoniac.

- 58b. R Hydrarg. Perchlor. gr. iii., Ammon. Hydrochloratis ℥ii., Tr. Benzoini ℥ii., Aquæ Rosæ ad ℥viii. M. An excellent lotion for lentigo and other pigmentary spots.

Hyposulphite of Sodium.

- 58c. R Sodii Hyposulphitis ℥ii., Glycerini ℥iv., Aquæ Rosæ ad ℥iv. M. Useful in all varieties of tinea.

Austro-German "Yellow" and "Black" Washes.

- 58d. Aq. Phagedænica Lutea (yellow-wash)—Hydrarg. Mur. Corros. Pulv. 0·1, Aquæ Calcis, 30·0.
Aq. Phagedænica Nigra (black-wash)—Calomelanos, 2·0, Pulv. Opii, 2·5, Aq. Calcis, 100·0.
Washes employed in syphilitic ulcers.

- 58e. Aqua Lucis (Eau de Luce)—Spirit. Sap., Spt. Vin. Rect. ãã 10·0, Liquor Am. Const. 15·0, Bala. Vitæ Hoffmann., 0·8.

In bites of insects or snakes, parts bitten to be washed with this lotion.

XI.—OINTMENTS.

Lead and Vaseline.

59. R Emplast. Plumbi, Vaselini, ãã ʒii. M.—Apply on strips of lint twice a-day.
Most valuable in subacute eczema, especially of the limbs.
A modification of Hebra's *Ungt. diachyli*.

Oxide of Zinc and Camphor.

- 59a. R Spt. Camph. ʒi., Glycerini ʒii., Ungt. Zinci ʒi. M.
Useful in eczema, especially in children.

Oil of Cade.

60. R Ol. Cadini, Spt. Vini. Rect., Sapon. Mollis, ãã ʒj., Spt. Lavand. ʒiiss. M.
Recommended by Dr. M'Call Anderson in eczema.

Oil of Cade and Glycerine of Starch.

- 60a. R Ol. Cadini ʒii., Glycerini Amyli ad ʒi. M.
A mild stimulant. Used in chronic eczema.

Sulphur and Potash.

- 60b. R Sulphuris Sublim. ʒii., Potass. Carb. ʒi., Adipis ʒi. M.
Used in scabies. To be rubbed in firmly over whole surface, except face and head, for 3 nights in succession.

Storax.

- 60c. R Styraçis Præparat. ʒii., Adipis ʒi. M.
Used for scabies in patients with a delicate skin.

Bismuth, Zinc, and Prussic Acid.

61. R Bismuthi Trisnitrat. ʒj., Ungt. Zinc. ʒj., Acid. Hydrocyanici Dil. ʒj. M.
Useful in various skin affections.
62. R Balsami Tolutani ʒij., Olei Rosmarini m. xx., Tinct. Cantharid. ʒj., Olei Ricini ʒss., Adipis Præp. ʒiiss. M.
To be rubbed in night and morning to roots of hair in cases of baldness, after syphilis, fevers, etc.

Aconitine and Iodine.

63. \mathcal{R} Aconitinæ gr. ij., Ungt. Iodi \mathfrak{z} j. M.—To be painted over part in severe neuralgia (tic-douloureux).

Citrine Ointment.

64. \mathcal{R} Ungt. Hydrarg. Nit. \mathfrak{z} l., Adipis \mathfrak{z} i. M.
Used in vesicular, squamous, and some parasitic affections.

White Precipitate.

- 64a. \mathcal{R} Hydrarg. Ammoniat. gr. xii., Vaselini \mathfrak{z} i. M.—Rub in at night.
A mild parasiticide and a stimulant in chronic eczema.

Tar and Mercury.

- 64b. \mathcal{R} Ungt. Hydrarg. Nitratis \mathfrak{z} iss., Picis Liquidi vel Ol. Cadini \mathfrak{z} ii., Adipis Benzoat. ad \mathfrak{z} i.
Used in chronic eczema and for pruriginous eruptions.

Iodide of Sulphur Ointment.

65. \mathcal{R} Sulph. Iodid. gr. x., Sulph. Sublim. gr. x., Acid. Hydrocyan. dil. m. x., Adipis \mathfrak{z} i. M.
Used in acne and other skin affections.

Chrysophanic Acid Ointment.

- 65a. \mathcal{R} Acidi Chrysophanici \mathfrak{z} i., Adipis \mathfrak{z} i. About the size of a bean to be rubbed into each patch of psoriasis daily.

Compound Citrine Ointment.

(Dr. Alder Smith's.)

- 65b. \mathcal{R} Acid. Carbol. Pur., Ungt. Hydrarg. Nitratis, Ungt. Sulphuris, aa \mathfrak{z} i. M.—Rub in every night.
Most valuable in ringworm of the head; for children under ten double or treble the amount of sulphur ointment.

Oleate of Mercury.

- 65c. \mathcal{R} Hydrarg. Oleatis (5 %) \mathfrak{z} vii., Etheris Acet. \mathfrak{z} i. M.—Rub in night and morning.
Very serviceable in ringworm of the head.

Cod-liver Oil Emulsion.

- 65d. \mathcal{R} Ol. Morrhuæ \mathfrak{z} ii., rub up with 30 grs. of Pulv. Acaciæ and \mathfrak{z} iss. of Aq. Destill. till an emulsion is formed; then gradually add with constant trituration \mathfrak{z} l. of Aq. Menth. Pip.

Depilatory.

- 65e. \mathcal{R} Sodii Sulphidi \mathfrak{z} iii., Calcis \mathfrak{z} x., Amyli \mathfrak{z} x. M.—Mix with water to make a paste; apply to the skin for two minutes, then scrape off.

XII.—SALINES.

66. \mathcal{R} Spt. Ammon. Aromat. \mathfrak{z} ij., Liq. Ammon. Citrat. \mathfrak{z} iv., Syrup. Limon. \mathfrak{z} j., Aquæ ad \mathfrak{z} vij. M.—A tablespoonful every three or four hours.

Useful in early stages of tonsillitis, diphtheria, or in febricula.

" Spiritus Ammonii Aromaticus, Liquor Ammonii Citratis, Syrupus Limonis."

66. Recipe—Spiritus Ammonii Aromatici drachmas tres, Liquoris Ammonii Citratis uncias quatuor, Syrupi Limonis unciam, Aquæ ad uncias octo. Misce.

Signa—A tablespoonful every three or four hours. Useful in early stages of tonsillitis, diphtheria, or in febricula.

Chlorate of Potassium (Fever-drink).

67. \mathcal{R} Potass. Chlorat. \mathfrak{z} j., Aquæ Oj. S.

Recommended as a daily drink in scarlet or other fever.

Colchicum and Magnesia.

68. \mathcal{R} Tinct. Colchici \mathfrak{z} ss., Magnes. Carb. \mathfrak{z} ij., Aquæ ad \mathfrak{z} vj. M.—A tablespoonful every three hours.

Useful in Gout.

Colchicum et Magnesii Carbonas.

68. Recipe—Tincturæ Colchici drachmam cum semisse, Magnesii Carbonatis drachmas duas, Aquæ ad uncias sex. Misce.

A tablespoonful every three hours. Useful in gout.

- 68a. \mathcal{R} Vini Colchici \mathfrak{z} ss., Magnes. Carb. gr. xv., Magnes. Sulphat. \mathfrak{z} j., Aquæ Cinnamom. ad \mathfrak{z} ij. M.

This draught is recommended by Sir Charles Scudamore during the paroxysm of gout.

Dr. Mortimer Granville's Prescription for Gout.

- 68b. \mathcal{R} Ammonii Chloridi \mathfrak{z} iv., Potassii Chloratis \mathfrak{z} ii., Tincturæ Iodi \mathfrak{z} ii., Glycerini \mathfrak{z} ss., Aquæ ad \mathfrak{z} xii. M.

Two tablespoonfuls every four hours in water.

Also in gout, if fever is sthenic, Dr. Granville recommends—

- 68c. \mathcal{R} Tincturæ Aconiti (B. P.) \mathfrak{m} xii., Ammonii Phosphatis \mathfrak{z} ss. Decocti Scoparii \mathfrak{z} xii. M.

Two tablespoonfuls every 3d or 4th hour.

XIII.—SEDATIVES.

Bromide of Potassium and Hydrate of Chloral.

69. R Potass. Bromid. ℥ij., Syrupi Chloral ℥ii., Aquæ ℥vj.—
A tablespoonful every two hours. To child, tea-
spoonful.

Useful in delirium tremens, and also in fevers when there
is great restlessness; to children, in convulsions or false
croup.

Opium and Antimony.

70. R Tinct. Opii ℥ii., Antimonii Tartar. gr. iv., Aquæ Camph.
ad ℥vj. M.—A tablespoonful every two hours until
sleep is produced.

Useful in delirium tremens.

“Mistura Potassii Bromidi.”

- 70a. Recipe—Olei Aurantii, Olei Anisi, Olei Caryophylli, āā
minimum, Spiritus Vini Rectificati unciam, Syrupi un-
ciam, Sacchari usti quantum sufficiat. Misce.

Et Recipe—Potassii Bromidi drachmas tres, Aquæ uncias
quatuor cum semisse. Misce.

Mix the two solutions.

Signa—A dessert-spoonful in a half glassful of water at
bed-time. Recommended in sea-sickness.

Morphine and Hydrocyanic Acid.

71. R Morphinae Hydrochlor. gr. i., Acid Hydrochlor. Dil. m.
v., Acid. Hydrocyanic. Dil. ℥ss., Syrup. Scillæ ℥j.
Aquæ ℥i. M.—One teaspoonful to be taken when
cough is very severe, as in advanced cases of phthisis.

Bromide of Potassium and Ergot.

- 71a. R Potass. Bromid. ℥ij., Extract. Ergotæ Liquid. ℥ij.,
Aquæ ad ℥vj. M.—A tablespoonful three times a day.

Useful in cerebral congestion, and also in infantile spinal
paralysis in early stage.

“Potassii Bromidum et Extractum Ergotæ Liquidum.”

- 71a. Recipe—Potassii Bromidi drachmas tres, Extracti Ergotæ
Liquidum drachmas duas, Aquæ ad uncias sex. Misce.

Signa—A tablespoonful thrice a day.

Useful in cerebral congestion, and also in infantile
spinal paralysis in early stages.

Brown-Séguard's Mixture of Bromide of Potassium, for Epilepsy.

- 71b. Recipe—Potassii Iodidi drachmas duas, Potassii Bromidi unciam, Ammonii Bromidi drachmas tres, Potassii Bicarbonatis drachmam, Tincturæ Calumbæ minima sexaginta, Aquæ Destillatæ uncias sex. Misce.

To adults four doses a day, three of one teaspoonful each before meals, and the fourth of three teaspoonfuls at bedtime, with as much water as desired.

- 71c. Pulv. Doveri. The German Pharmacopœia Dover's powder is thus prepared, 0·08 of pulv. Opii, 0·08 of pulv. Ipecac., and 0·6 of Sugar.

XIV.—STIMULANTS.

Spirit of Chloroform and Brandy Mixture.

72. R Spt. Chloroform. ʒij., Mist. Spt. Vini Gallici ad ʒvj. M.
—A tablespoonful every two hours in the low stages of fevers or other exhausting diseases.

Spiritus Chloroformi et Mistura Spiritus Vini Gallici.

72. Recipe — Spiritus Chloroformi drachmas duas, Misturæ Spiritus Vini Gallici ad uncias sex. Misce.

A delicious restorative.

Signa—A tablespoonful every two hours in the low stages of fevers or other exhausting diseases.

Ammonia, Potash, and Rhubarb.

73. R Spt. Ammon. Aromat., Liquor. Potass., Tinct. Rhei, aa ʒj. M.—A teaspoonful twice a day in water, as an antacid stimulant and stomachic.

Soda and Calumba.

74. R Sodii Bicarb. ʒj., Tinct. Calumb. ʒvj., Aquæ Anethi ad ʒvj. M.—A tablespoonful every three hours.
Useful to relieve heartburn and nausea.

XV.—TONICS.

Quinine Mixture.

75. R Quininæ Sulphatis ʒj., Acid. Sulph. dil. ʒiss., Syrup. Aurant., Tinct. Aurant., aa ʒiv., Aquæ ad ʒvj. M.—A dessert-spoonful three times a day.

Quininæ Sulphatis Mistura.

75. Recipe—Quininæ Sulphatis grana sexaginta, Acidi Sulphurici diluti drachmam cum semisse, Syrupi Aurantii, Tincturæ Aurantii ana drachmas quatuor, Aquæ ad uncias sex. Misce.

Signa—A dessert-spoonful three times a day.

Iron, Quinine, and Ammonia.

76. R Ferri et Quininæ Citratis ʒiss., Ammon. Carbonatis ʒij., Tinct. Aurantii ʒij., Aquæ ad ʒvi. M.—A table-spoonful three times a day.

Quinine and Gentian.

77. R Ferri et Quininæ Citratis, Ext. Gentian., aa ʒss. M.—To be divided into eighteen pills. One to be taken twice a day.

Iron, Hydrochloric Acid, and Calumba.

78. R Tinct. Ferri Perchlor. ʒiss., Quin. Sulph. grs. 60, Acid. Hydrochlor. Dil. ʒj., Tinct. Hyoscyam. ʒiii., Inf. Calumb. ad ʒvj. M.—A tablespoonful three times a day.

Tinctura Ferri Perchloridi, Quininæ Sulphas, Acidum Hydrochloricum dilutum.

78. Recipe—Tincturæ Ferri Perchloridi drachmam cum semisse, Quininæ Sulphatis grana sexaginta, Acidi Hydrochlorici diluti drachmam, Tincturæ Hyoscyami drachmas tres, Infusi Calumbæ ad uncias sex. Misce.

Signa—A tablespoonful thrice daily.

Iron, Calumba, and Glycerine.

79. R Tinct. Ferri Perchlor. ʒij., Tinct. Calumbæ ʒij., Glycerini ʒij., Aquæ ad ʒvj. M.—A tablespoonful three times a day.

Useful in anæmia, and sometimes also in phthisis.

Nitro-Muriatic Acid and Gentian.

- 79a. R Acid. Nitro-Mur. Dil. ʒii., Tinct. Gentian. ʒiiis., Decoct. Taraxaci ʒvi. M.—A tablespoonful thrice daily.

Acidum Nitro-hydrochloricum Dilutum, Tinctura Gentianæ, Decoctum Taraxaci.

- 79a. Recipe—Acidi Nitro-hydrochlorici Diluti drachmas duas, Tincturæ Gentianæ drachmas tres cum semisse, Decocti Taraxaci uncias sex. Misce.

Signa—A tablespoonful thrice daily.

Strychnine and Nitric Acid.

80. R Liquor. Strychninæ Hydrochlor. ℥j., Acid. Nitric. Dil. ℥ss., Acid. Hydrochlor. Dil. ℥ss., Tinct. Zingib. ℥ijss., Syrup. Croci ℥ij., Aquæ ad ℥vj. M.—A tablespoonful three times a day.

Useful in some spinal affections.

- 80a. R Strychninæ Sulphatis gr. $\frac{1}{4}$, Acidi Phosphor. dil. ℥ss. Syr. Aurantii ℥i, Aquæ ℥ii. M.—Recommended several times daily in spinal irritation (Hammond).

Syrup of Iodide of Iron and Cod-Liver Oil.

81. R Syrupi Ferri Iodidi ℥ij., Mucilag. Acaciæ ℥j., Ol. Morrhue ad ℥vi. M.—A tablespoonful three times a day.

Hypophosphite of Lime and Glycerine.

82. R Calcii Hypophosphitis ℥j., Glycerini ℥vj. S.—A tablespoonful three times a day.

Calcis Hypophosphis et Glycerinum.

82. Recipe—Calcis Hypophosphitis grana sexaginta, Glycerini uncias sex. Solve.

Signa—A tablespoonful three times a day.

Hypophosphite of Lime and Syrup.

- 82a. R Calcis Hypophosphitis ℥l., Syrupi ℥vj. M.—A tablespoonful thrice daily.

“Calcis Hypophosphis et Syrupus.”

- 82a. Recipe—Calcis Hypophosphitis grana sexaginta, Syrupi uncias sex. Misce.

Signa—A tablespoonful three times a day.

Iron and Gentian.

83. R Ferri Sulphatis Exsicc., Ext. Gentian., aa ℥ss. M.—Divide into twelve pills; one twice daily.

Citric Acid, Citrate of Iron, Bismuth, and Prussic Acid.

84. R Ferri Citratis ℥ss., Acid. Citrici ℥vj., Aquæ ℥vj. Misce.
R Acid. Hydrocyanici dil. m. lxxij., Potass. Bicar. ℥vj., Liq. Bismuth., Syrup. Aurantii, aa ℥ij. M.—A dessert-spoonful of the contents of each, in a glass of water, thrice daily.

Recommended in dropsy from granular kidney.

Strychnine, Phosphorus, and Quinine.

85. R Strychninæ gr. i., Ferri Pyrophosphatis, Quininæ Sulph. aa ʒi.; Acid. Phosph. Dil., Syrup. Zingiber., aa ʒij. M.—A teaspoonful three times a day in a little water. Recommended in some nervous affections when strychnine is required.

Phosphorus.

86. R Olei Phosphorat. ʒss., Mucilag. Acaciæ ʒj., Olei Bergamot. gtt. xl. M.—Twenty-five drops three times a day. Useful in nervous affections requiring phosphorus.

Salicylic Acid Mixture.

87. R Acid. Salicylici ʒij., Potass. Acetat. ʒiss., Aquæ ʒvj. S.—A tablespoonful every three hours. Recommended in rheumatic fever.

"Mistura Acidi Salicylici."

87. Recipe—Acidi Salicylici drachmas duas, Potassii Acetatis drachmam cum semisse, Aquæ uncias sex. Solve. Signa—A tablespoonful every three hours. In acute rheumatism.

88. R Salicini gr. xx.—To be given every three hours.

Digitalis and Iron.

89. R Tincturæ Ferri Perchloridi ʒii., Tincturæ Digitalis ʒii., Aquæ ʒvss. M.—A tablespoonful twice or thrice daily.

"Digitalis et Tinctura Ferri Perchloridi."

89. Recipe—Tincturæ Ferri Perchloridi drachmas duas, Tincturæ Digitalis drachmas duas, Aquæ uncias quinque cum semisse. Misce.

Signa—A tablespoonful twice or thrice daily. In heart disease with anæmia.

"Blaud's Pills."

- 89a. Recipe—Ferri Sulphatis grana triginta, Potassii Carbonatis grana triginta, Mucilaginis Tragacanthæ quantum sufficiat. Misce. Divide into eighteen pills. Signa—One thrice daily at first, and increased by one pill every day.

In chlorosis and anæmia in young girls previous to puberty.

Ammonia, Citrate of Iron, and Calumba.

90. R Ferri Ammon. Citrat. ʒj., Tinct. Calumbæ ʒiii., Aquæ Camph. ad ʒvj. M.—A tablespoonful thrice daily. Useful tonic in kidney disease, etc.

Rhubarb and Pepsin.

91. *R* Pulv. Rhei gr. iv., Pepsinæ gr. iij. *M.*
Useful in dyspepsia with flatulence. To be taken after meals.

Phosphate Mixture for Diabetes.

- 91a. *R* Bone Ash of Femur, gr. 1040; Light Calc. Magnesia, gr. 406; Bicarbonate of Potassium, gr. 900; Phosphate of Sodium, gr. 3520; Syrupy Phosphoric Acid, q.s.; Water, q.s. Powder the Bone Ash finely, and add 4 ounces of the Syrupy Phosphoric Acid, previously diluted with the same bulk of water. Mix thoroughly and allow the mixture to stand six or eight hours; add to the Magnesia a sufficiency of water to make a mass, and a sufficiency of the phosphoric acid to form a solution. Dissolve the phosphate of sodium and bicarbonate of potassium in 16 oz. of water, and add the solution of magnesia, and then sufficient phosphoric acid to make a clear solution. Mix the Bone Ash and phosphoric acid, add water to form three pints, then filter the clear fluid. It must be made up by washing the filter to 64 oz.

℥i. in water after food.

Chlorate of Potassium, Iron, and Glycerine.

- 91b. *R* Potass. Chlorat. gr. v., Tinct. Ferri Perchlor., m.v., Glycerini, m.xx., Aquæ ad ℥i. *M.*—Every two hours in scarlet fever.

"Potassii Chloras, Tinctura Ferri Perchloridi, et Glycerinum."

- 91b. Recipe—Potassii Chloratis grana quinque, Tincturæ Ferri Perchloridi minima quinque, Glycerini minima viginti, Aquæ ad unciam. *Misce.*

Signa—The draught every two hours.
In scarlet fever.

Solution of Phosphorus.

- 91c. *R* Phosphori gr. ss.—iss., Alcohol. Absolut. ℥ii. to dissolve, Ess. Menth. Pip. ℥i., Glycerini ad ℥iv. *M.*—In spinal irritation, a teaspoonful after food.

Oxide of Zinc Pills.

- 91d. *R* Zinci Oxidi gr.xxiv., Confectionis Rosæ, q.s. *M.*—Divide into xx. pills; one to be taken three times a day after meals.

In spinal irritation, $\frac{1}{2}$ gr. of Ext. Nucis Vomice may be added to each pill.

Test for Diabetic Urine.

92. Fehling's Standard Solution is prepared according to the following prescription :—Sulphate of Copper, 90½ grains ; Neutral Tartrate of Potash, 364 grains ; Solution of Caustic Soda, sp. gr. 1·12, four fluid ounces ; add water to make up exactly six fluid ounces. 200 grains of this solution are exactly decomposed by *one* grain of sugar.

The Ureameter.

93. To estimate the quantity of urea, the following apparatus is useful. The principle of the process depends on the evolution of nitrogen gas which ensues when urine comes in contact with hypobromite of sodium. The first step is to make a solution of caustic soda, which is done by taking of Caustic Soda 1 oz., Water 2½ oz. Measure of this solution, as per mark on bottle, minims 420 ; add 40 minims of bromine. Shake well and allow the mixture to cool thoroughly. We have now a solution of Hypobromite of Sodium.

Next, take of the urine to be tested, as per pipette, 65 minims, which place in a small tube. Insert this into the bottle containing the Hypobromite of sodium solution. Cork, and read off the marking of the graduated tube.

Next, allow the urine and hypobromite of sodium to mix. The result is the evolution of nitrogen gas. When the decomposition is completed, the graduated index, after deducting the first from the last reading, will reveal the volume of nitrogen gas.

Mr. Dittmar, Professor of Chemistry at Anderson's College, has so constructed the index that each degree of it corresponds to one grain of urea per ounce in the urine. It is thus only necessary to measure the whole quantity of urine passed in the twenty-four hours, and then multiply that by what the index shows, after the evolution of nitrogen gas, to tell the quantity of urea excreted daily.

Thus, supposing the quantity of urine passed in twenty-four hours to be 50 ounces, and the number of grains per ounce of urine as read off to be 8, the total quantity of urea will be $50 \times 8 = 400$ grains.

The apparatus can be obtained from Mr. Hume, Lothian Street, Edinburgh.

94. The formula given by Mayer for detecting Quinine in the urine is, Water, 10; Corrosive Sublimate, 12·54; Iodide of Potassium, 49. A cubic centimetre of this solution precipitates a centigramme of Quinine, and the precipitate does not disappear; it is insoluble.

METRIC SYSTEM.

The metric system of weights and measures has come largely into use of late years. On the Continent it has been long employed to the exclusion of all others, while in America it seems to be rapidly displacing the older methods. Its uniformity, the extent to which it has been adopted in other countries, its decimal character, and the avoidance of reductions (as from feet to inches, and so on), confer on it undeniable advantages, not only in scientific calculations but in trade transactions of almost all kinds. The student should therefore be acquainted with it, otherwise many matters in foreign scientific works will be to him unintelligible. The tables given below show the relation of the metric to the English weights and measures. In prescribing and dispensing, however, the metric system will be found to be much less workable than the present method; it is accordingly little likely to supersede it in this country. The facts that materials prescribed and dispensed by *weight* would universally, in the case of fluids at least, be consumed by *measure*, that the prescriber would constantly have to bear in mind the exact relation of weight to bulk—an obvious source of confusion in ordering complex mixtures—and that mistakes would be just as apt to occur from the misplacement of the decimal point as from the misreading of the scruple, drachm, and ounce signs, appear to be fatal to the pretensions of this system to any practical superiority.

MEASURES OF LENGTH.

Millimetre	0·001 of a Metre	0·03937 inch.
Centimetre	0·01 ,,	0·39370 ,,
Decimetre	0·1 ,,	3·93707 inches.
METRE		39·37079 ,,
Decametre	10 Metres	393·70790 ,, = 32 ft. 9·7 in.
Hectometre	100 ,,	3937·07900 ,, = 328 ft. 1·07 in.
Kilometre	1000 ,,	39370·79000 ,, = 1093·633 yds.
Myriometre	10000 ,,	393707·90000 ,, = 6·213 miles
The English inch = 2·539 Centimetres, or 0·025 metre.		
,, foot = 3·0479 Decimetres, or 0·304 metre.		
,, yard = 0·9143 Metre.		
,, mile = 1·6093 Kilometre.		

WEIGHTS.

Milligramme	0·001 of a gramme .	0·015 grain.
Centigramme	0·01 " "	0·154 "
Decigramme	0·1 " "	1·543 "
GRAMME	15·432 grains.
Decagramme	10 grammes	154·323 "
Hectogramme	100 " "	1543·234 " = 0·22 lb. av.
Kilogramme	1000 " "	15432·348 " = 2·204 lb. av.
Myriogramme	10000 " "	154323·488 " = 22·046 lb. av.

The English grain = 6·479 centigrammes, or 0·064 gramme.

" " drachm = 3·84 (or nearly 4) grammes.

" " ounce (avdp.) = 28·349 grammes.

" " ounce (troy) = 31·103 grammes.

" " pound (avdp.) = 453·592 grammes.

MEASURES OF CAPACITY.

Millilitre or 1 cubic centimetre	0·061 cubic inch.
Centilitre 10 " "	0·610 " "
Decilitre 100 " "	6·102 " " = 0·176 pt.
Litre = cubic decimetres	61·027 " " = 1·76 "
Decalitre	17·607 pints = 2·2 gallons.
Hectolitre	22·009 gallons.
Kilolitre = cubic metre	220·09 "
Myriolitre	2200·96 "

The English cubic inch = 16·386 cubic centimetres.

" " foot = 28·315 cubic decimetres.

" " gallon = 4·543 litres.

Prescribing will be facilitated by bearing in mind the following *approximate* equivalents:—

M. i. or gr. i. = 0·06 cubic centimetre or 0·06 gramme.

M. xv. or gr. xv. = 1 " " or 1 "

F. ʒi. or ʒi. = 4 " " or 4 "

F. ʒi. or ʒi. = 32 " " or 32 "

The gramme and the cubic centimetre, when referring to liquids, may be regarded as equal, except when the liquids are very heavy or very light.

An ordinary teaspoon holds about 5 cubic centimetres, an ordinary tablespoon about 20 c.c.

100 grms. or c.c. of water make about 20 teaspoonfuls, or 5 tablespoonfuls.

The following is an example of a prescription calculated according to both styles:—

R Pepsinæ (B. P.)	℥i	4	00 Grm.
Acid. Hydrochlor. Dil. ℥i	℥i	6	00 c.c.
Syr. Aurant.	℥i	32	00 c.c.
Inf. Calumbæ ad	℥viii (M.)	250	00 c.c. (M.)

A line is frequently used instead of the decimal points, as being less likely to give rise to errors.

Powders, pills, and similar preparations are ordered in the metric system in the following manner:—The prescription for pills or powders is based upon ordering fifteen, then each grain desired in a single pill will correspond with one gramme of the sum total.

Recipe—Potassii Bicarbonatis (gr. ii. in each powder) 2 grm.
 Pulveris Cinnamomi Compositi (gr. iv. in each powder)
 4 grms.
 Bismuthi Subnitratæ (gr. vi. in each powder) 6 grms.
 Misce.—Divide into xv. powders.

For the sake of simplicity in prescriptions, it is well to order of the powder a number which is either a factor or a multiple of a factor of 15.

Recipe—Calomelanos gr. i. in each powder =		
grm. i., less $\frac{1}{4}$ = grm. $\frac{3}{4}$	= 0	68 Grm.
Pulveris Rhei gr. vi. in each powder =		
grm. vi., less $\frac{1}{4}$ = grm. iv.	= 4	00 „
Pulveris Cretæ Præparatæ gr. iii. in each		
powder = grm. iii., less $\frac{1}{4}$ = grm. ii.	= 2	00 „
Misce.—Divide into ten powders ($15 - \frac{1}{4}$ of 15 = 10).		

In ordering dry preparations of powders or pills, a slight error should not be overlooked, viz. for every grain we order in a dose we get a larger quantity than this, e.g. $1\frac{1}{4}$ grain, since 1 gramme equals 15.432 grains.

THERMOMETRIC SCALES.

In the Centigrade (or Celsius) scale, used universally in Continental works on Medicine, the freezing point of water is taken as zero, and the distance from it to the boiling point of water is divided into 100 degrees; Fahrenheit's scale, on the other hand, begins at 32 degrees below the freezing point of water, from which latter to the boiling point of water is divided into 180 degrees. So that in the Centigrade scale the freezing and boiling points of water are 0° and 100° respectively, in Fahrenheit's scale, 32° and 212°. Degrees Fahrenheit therefore bear to degrees Centigrade the relation of 180 to 100, that is 9 to 5; but in calculating, the extra 32 degrees of Fahrenheit's scale must be kept in mind, and must be first subtracted in converting F. into C., and added, after multiplying and dividing, in

converting C. into F. The rules will therefore stand thus: To convert degrees F. into degrees C., first subtract 32° , and then multiply by 5 and divide by 9; to convert degrees C. into degrees F., multiply by 9, divide by 5, and add 32° . Example:

Reduce 98.4° F. to degrees C.;

$$98.4 - 32 = 66.4$$

$$66.4 \times 5 = 332.0$$

$$332.0 \div 9 = 36.8^{\circ} \text{C.}$$

Convert 39.5° C. into degrees F.

$$39.5 \times 9 = 355.5$$

$$355.5 \div 5 = 71.1$$

$$71.1 + 32 = 103.1^{\circ} \text{F.}$$

BATHS.

COLD BATH, to reduce temperature—

1. Cold affusion. The patient is placed in a bath and four or five gallons of cold water thrown over him.

2. The patient is placed in a bath about 90° F., and the temperature is gradually reduced to 80° , 70° , or 60° F. The patient is kept in the bath for about twenty minutes. Alluded to in continued fever (page 25).

3. Cold bath at once at a temperature of 60° to 90° . Ice may be put into this bath and the temperature reduced to 45° if the patient's temperature is very high, as in some cases of pneumonia, cerebral rheumatism, and pericarditis. Alluded to under pericarditis (page 224).

COLD SPONGING.—This is employed in cases when the previously-named baths might be dangerous. The loss of heat is due partly to the application of the cold water, and partly to the evaporation which takes place from the surface of the body. It may be employed in diseases where the temperature is 104° or 105° F., as in typhoid fever.

MUD BATHS.—These baths are prescribed in cases of hyperæsthesia, sleeplessness, and female disorders. Various Continental spas have the mud for these baths conveyed from divers places, but undoubtedly the natural home for the best mud baths is at Franzensbad. This spa is situated on a "peat moss;" and portions of this moss are worked up into a soft poultice consistence and at a temperature of 98.5° F.; the patient undressed sits in this conglomerated mass for ten or fifteen minutes. The sensations imparted are those of great rest and physical repose, with a tendency to sleep after emerging from the bath and being sponged with lukewarm water. They are generally ordered to be taken on alternate days.

TURKISH BATHS.—These baths are employed in chronic rheumatism, sciatica, lumbago, and Bright's disease. The bath consists usually of three rooms, one for undressing and for resting in after the bath is finished; a second at a moderate temperature of 130° to 140° F.; and a third or hot room, where the temperature may reach 180° or even 200° F. The patient is recommended to sit or lie on a couch in the second room for half an hour until perspiration is freely established, sipping cold water if necessary to allay thirst. He may, after the expiry of the time mentioned, try the hot room for fifteen minutes; but this should never be done if there is any tendency to cerebral congestion, if perspiration is not thoroughly established, and if a sensation of giddiness is experienced. After leaving the hot room the patient should proceed at once—not delaying in the second room—to the shampooing room, where an experienced rubber should knead individual muscles, and stretch arms, legs, and small joints firmly, yet without causing any pain, which is never to be desiderated. Afterwards the shampooer should lather him with soap, and allow the hot-spray bath to play on him for a minute or two, gradually bringing on first tepid and then cold spray. A swim through a cold pond completes the bathing process in most well-regulated Turkish bath establishments; coming from the pond he should be enveloped in a warm sheet and rest in the dressing-room until he feels perfectly cool, and then he should leisurely dress. If the Turkish bath is taken in winter a cup of coffee or tea should be drunk before going into the open air, and it is better to walk home than to be driven.

VAPOUR BATHS or RUSSIAN BATHS are not recommended for invalids. Some persons in good health seem to enjoy them, but they are inferior both in utility and comfort to Turkish baths. Calomel fumigation is referred to at page 85.

ACID BATH.—An acid bath is prepared by mixing eight ounces of nitro-hydrochloric acid with a gallon of water at 98° F. Flannel is soaked in this, then wrung out thoroughly, and applied as a compress to the liver. It should then be covered with oil-silk, and may be allowed to remain on for some hours or even a day. This acid compress is recommended in enlargement of the liver, especially in cases in which this is caused by residence in a tropical climate.

ALKALINE BATH.—This is prepared by adding sixty grains of crystallised carbonate of sodium to each gallon of water. It is useful in chronic skin diseases.

CONIUM BATH.—This bath is prepared by adding to a full-length bath of tepid water at 98° F., three handfuls of conium leaves. In chronic skin affections, attended with great itching, as eczema or prurigo, it is singularly valuable. The patient should rest in it for about twenty minutes, the bath being

covered with a sheet and waterproof, and the head free. In this way there is no danger of the narcotic vapour affecting the cerebral circulation, or the central nervous system.

SULPHUROUS BATHS.—Artificial sulphurous baths are prepared by dissolving sulphurated potash in water—half a drachm to the gallon. Such baths have been recommended in psoriasis and chronic rheumatism. They are, however, much inferior to the natural sulphur baths obtained at Aix-la-Chapelle, Aix-les-Bains, and Neuenahr, the benefit from which in constitutional syphilis and chronic rheumatism is very great.

PINE BATH.—At various Continental spas of a muriated saline character, as Homburg, Kissingen, or Marienbad, pine baths are in common use. To the water of these spas heated in a bath about eight ounces of decoction of pine are added. This gives the bath a pleasant perfume, and the sensation to the skin of the bather is delightful. They are recommended in chronic gout, chronic rheumatism, and hyperæsthesia.

MUSTARD BATH.—The mustard bath requires about sixty grains of mustard to be added to a gallon of water. A foot-bath or a full bath of this is recommended in some cases to bring out the eruption in exanthemata. In neither case should the bath be continued longer than ten minutes.

CHANGES IN THE BRITISH PHARMACOPŒIA OF 1885.

ARRANGED ALPHABETICALLY.

- Acidum Boricum—antiseptic. Unguent, 1 of Acid, 2 of Paraffin, 4 Vaseline.
- Chromicum—caustic and disinfectant. Solution, 1 to 3, for external use.
- Hydrobromicum Dilutum, 10 per cent of absolute Hydrobromic Acid and 90 per cent of water. Dose, m. 15-50.
- Lacticum. 75 per cent of Lactic Acid, 25 per cent of water. Ac. Lacticum Dil. = 3 of preceding, with a sufficiency of water to make a pint; dose, ʒss.-ʒii.
- Oleicum. Formed by decomposing palm oil by superheated steam. A yellowish oily liquid, employed to make ointments.
- Salicylicum—for internal use. Preferably prepared from Salicinum—antipyretic. Dose, v. grs. to xxx. grs.
- Apomorphinæ Hydrochloras. Dose, $\frac{1}{4}$ gr. Emetic.
- Argenti et Potassii Nitras. Dose, $\frac{1}{2}$ gr. internally. Externally caustic.

- Arsenii Iodidum—alterative. Dose, $\frac{1}{10}$ gr.
 Butyl-chloral Hydras (Croton-chloral Hydras)—anodyne. Dose, ii. to v. grs.
 Caffeina, prep. Citras Caffeinæ—cardiac tonic, diuretic. Dose, gr. v.
 Chrysarobin (Acidum Chrysophanicum). Dose, $\frac{1}{4}$ to $\frac{1}{2}$ gr.
 — Unguentum Chrysarobini (Chrysarobin, 10; Benzoated Lard, 240).
 Cimicifuga. Preparations—Ext. Cimicifugæ Liquidum, 3 to 30 m.; Tinctura, 15 to 60 m.
 Coca (Erythroxylon), prep. Extr. Cocæ Fluidum, 3ss. to ʒii.—Cocainæ Hydrochloras. Dose, $\frac{1}{4}$ to 1 gr.
 Elaterinum. Hydragogue Cathartic. Dose, $\frac{1}{16}$ to $\frac{1}{8}$ gr.
 Ergotinum (Injectio Ergotini Hypodermica), 100 grs. of Ergotin in 200 fl. grs. of camphor water. Dose, 3 to 10 m.
 Eucalypti Oleum. Dose, 1 to 4 m. Ungt. Eucalypti.
 Extractum Cascaræ Sagradæ, obtained from bark of *Rhamnus Purshiana*. Dose, 2 to 8 grs.
 — — — Liquidum, 3ss. to ʒii. as a purgative in early morning.
 — Gelsemii Alcoholicum—nervine tonic. Dose, $\frac{1}{2}$ -2 grs.
 — Jaborandi—diaphoretic. Dose, 2 to 10 grs.
 Gelsemium, grs. 5 to 30.
 Glycerinum Aluminis—astrigent, antiseptic.
 — Plumbi Acetatis—astrigent, antiseptic.
 — Tragacanthæ—astrigent, demulcent.
 Injectio Apomorphinæ Hypodermica. Dose, 2-8 m.
 Iodoformi Suppositoria, gr., iii. in each; Unguentum, i. to x.
 Jaborandi; Extractum, Infusum, Tinctura.
 Lamellæ Atropinæ, $\frac{1}{1000}$ gr. of the Sulphate.
 — Cocainæ, $\frac{1}{100}$ gr. of the Hydrochlorate.
 — Physostigminæ, $\frac{1}{1000}$ gr. of the Alkaloid.
 Liquor Arsenii et Hydrargyri Iodidi.
 — Ferri Dialysatus.
 Liquor Sodii Ethylatis.
 Menthol; Anæsthetic, Rubefacient.
 Oleatum Hydrargyri, 10 per cent.
 Oleatum Zinci, 10 per cent.
 Paraffinum Durum.
 Paraffinum Molle.
 Pilocarpinæ Nitras— $\frac{1}{4}$ to $\frac{1}{2}$ internally, or by subcutaneous injection.
 Pini Sylvestris Oleum. Preparation—Vapor.
 Rhamnus Frangula. Ext. Rhamni Frangulæ, 15 to 60 grains;
 Ext. Rhamni Frang. liq., 1 to 4 fluid drachms.
 Salicinum. Dose, 3 to 20 grs.
 Santali Oleum. Dose, 10 to 30 m.
 Sodii Bromidum. Dose, 10 to 30 grs.

Sodii Iodidum. Dose, 3 to 10 grs.
 „ Salicylas. Dose, x. to xxx. grs.
 „ Sulpho-carbolas. Dose, x. to xv. grs.
 Spiritus Ætheris Compositus (Hoffman's Anodyne).
 Staphisagriæ Semina, Unguentum.
 Tabellæ Nitro-glycerini ($\frac{1}{100}$ gr. in chocolate). Dose, i. or ii.
 Tinctura Gelsemii. Dose, m. 5 to 20.
 Thymol.
 Trochisci Santonini, 1 to 6 troches.
 Unguentum Acidi Borici.
 Unguentum Hydrargyri Nitratis Dilutum.
 Unguentum Zinci Oleati.
 Zinci Sulpho-carbolas.

Drugs and Preparations omitted in the New Pharmacopœia,
 1885.

Areca.	Infusum Dulcamaræ.
Cadmii Iodidum.	Liquor Atropiæ.
Castoreum.	Mistura Gentianæ.
Decoctum Ulmi.	Pilula Quiniæ.
Digitalinum.	Rhamni Succus.
Dulcamara.	Sodæ Acetas.
Enema Tabaci.	Stramonii Folia.
Ferri Iodidum.	Syrupus Rhamni.
Ferri Oxidum Magneticum.	Tinctura Castorei.
Ferri Peroxidum Humidum.	Ulmi Cortex.
Hydrargyri Iodidum Viride.	Unguentum Cadmii Iodidi.

New Preparations of Drugs which were in the "Pharmacopœia"
of 1867, or the "Additions" of 1874.

<i>Articles.</i>	<i>Preparations.</i>
Of Alcohol.	Alcohol Ethylicum.
„ Aloes.	Aloin.
„ Alum.	Glycerinum Aluminis.
„ Ammonium.	Liquor Ammonii Acetatis fortior.
	Liquor Ammonii Citratis fortior.
„ Arsenic.	Arsenii Iodidum. <i>Prep.</i> : Liquor Arsenii et Hydrargyri Iodidi.
„ Belladonna.	Extractum B. Alcoholicum. <i>Prep.</i> : Emplastrum B. and Unguentum B.
	Lamellæ Atropinæ ($\frac{1}{1000}$ gr.).
„ Bismuth.	Bismuthi Citras. <i>Prep.</i> : Liquor Bismuthi et Ammonii Citratis, from which again is prepared Bismuthi et Ammonii Citras.

<i>Articles.</i>	<i>Preparations.</i>
Of Calabar Bean (Physostigmatis semen).	Physostigminæ. <i>Prep.</i> : Lamellæ physostigminæ (1000 gr.).
„ Calcium Salts.	Calcii Sulphas. <i>Prep.</i> : Calx Sulphurata.
„ Carbohc Acid.	Liquor Calcii Chloridi.
„ Cinchona Barks.	Acidum Carbohcum Liquefactum.
	Unguentum Acidi Carbolici.
	Cinchonidinæ Sulphas.
	Cinchoninæ Sulphas.
	Quininæ Hydrochloras. <i>Prep.</i> : Tinctura Quininæ.
„ Cinnamon.	Spiritus Cinnamomi.
„ Copper.	Cupri Nitras.
„ Cubebs.	Oleo-resina Cubebæ.
„ Elaterium.	Elaterin. <i>Prep.</i> : Pulvis Elaterini Compositus.
„ Ergot.	Ergotinum. <i>Prep.</i> : Injectio Ergotini Hypodermica.
„ Ether.	Spiritus Ætheris Compositus (Hoffman's Anodyne).
„ Iron.	Liquor Ferri Acetatis.
	„ „ „ Fortior.
	„ „ „ Dialysatus.
„ Lead.	Glycerinum Plumbi Subacetatis.
„ Lupulus.	Lupulina.
„ Mercury.	Unguentum Hydrargyri Nitratis Dilutum.
„ Opium.	Acidum Meconicum.
	Liquor Morphinæ Bimeconatis.
	Morphinæ Sulphas.
	Tinctura Chloroformi et Morphinæ.
	Codeina.
	Apomorphinæ Hydrochloras. <i>Prep.</i> : Injectio Apomorphinæ Hypodermica.
„ Podophyllin Resin.	Tinctura Podophylli (gr. j to 3j).
„ Potassium.	Potassii Cyanidum.
„ Pyroxylin.	Collodium Vesicans.
„ Santonin.	Trochisci Santonini.
„ Sodium.	Sodii Bromidum.
	„ Iodidum.
	„ Sulphis.
	„ Sulpho-carbolas.
„ Taraxacum.	Extractum Taraxaci Liquidum.
„ Tragacanth.	Glycerinum Tragacanthæ.
„ Zinc.	Zinci Sulphocarbolas.
	Calamina præparata.

GLOSSARY.

ACARUS SCABIEI.—From *d* neg., *κεῖρω* to cut, and *scabere* to scratch.—The itch insect, whose presence gives rise to scabies, a contagious disease of the skin attended with great itching.

ACNE.—From *ἀκμή*, strength.—An eruption of hard, distinct, and inflamed tubercles appearing on the forehead, temples, etc.

ÆGOPHONY.—From *αἴξ* a goat, and *φωνή* voice.—A sound similar to the bleating of a goat. Heard through the stethoscope, when applied to the inferior angle of the scapula, in cases of pleurisy with effusion.

ALOPECIA AREATA.—From *ἀλώπηξ* a fox (a common affection of this animal), and *area* an open space.—Loss of hair, leaving little circular or oval bald patches.

ALTERATIVES.—From *altero*, to vary.—Medicines which promote a salutary effect on the functions of the system without causing apparent evacuations.

AMENORRHEA.—From *d* neg., *μήν* a month, *ῥέω* to flow.—A suppression of the monthly discharge.

AMPHORIC.—From *ἀμφορεύς*, a Greek wine-vessel.—In auscultation, a sound similar to that produced by blowing into a decanter a little distance from the aperture.

AMYLOID.—From *d* neg., *μύλη* a mill, *i.e.* not ground in a mill.—Resembling starch. If iodine be applied to an amyloid organ, the affected portions change to a brown colour, but, on the subsequent application of sulphuric acid, a bluish tint is produced.

ANÆSTHESIA.—From *d* neg., *αἰσθάνομαι* to feel.—Loss of sensation.

ANASARCA.—From *ἀνά* through, *σάρξ* flesh.—A collection of serum in the integuments of the body, characterised by pitting on the application of pressure.

ANEURYSM.—From *ἀνευρίνω*, to make wide.—A swelling produced by the dilatation of an artery.

ANGINA PECTORIS.—From *ἀγχω* to strangle, and *pectus* the breast.—A dangerous affection, characterised by a sense of suffocation, severe pain at the chest, and great anxiety.

ANTHELMINTICS.—From *ἀντί* against, *ἐλμύς* a worm.—Medicines which expel worms from the intestines.

ANTIPYRETICS.—From *ἀντί* against, *πυρετός* fever.—Remedies used for allaying fever.

APHASIA.—From *ἀ* neg., *φάσις* speech.—A partial or complete loss of the power of speech, due to cerebral causes.

APHONIA.—From *ἀ* neg., *φωνή* voice.—Loss of voice.

APHTHA.—From *ἀπτεω*, to fix upon.—Thrush. Small round white vesicles affecting lips, mouth, and intestinal canal.

APOPLEXY.—From *ἀπό*, of the cause, *πλήσσω* to strike.—Loss of sensation and voluntary motion, whilst the respiration and heart's action are slightly, or not at all, affected.

ARCUS SENILIS.—From *arcus*, anything arched or curved, and *senilis* aged.—An opaque ring round the margin of the cornea, observed in old people.

ASCARIDES.—From *ἀ* intensivum, *σκαίρω* to bound, jump.—Intestinal worms.

ASCITES.—From *άσκος*, a leather sack or wine-skin.—A collection of serous fluid within the peritoneum.

ASTHMA.—From *ασθμάω*, to gasp for breath.—A sensation of suffocation, or constriction of the chest with cough and expectoration.

ATROPHY.—From *ἀ* neg., *τρέφω* to nourish.—Progressive wasting of the whole or a portion of the body, caused by decrease in size or number of its histological elements.

BOTHRIOCEPHALUS LATUS.—From *βοθρίον* a small pit, *κεφαλή* a head.—The broad tapeworm.

BRONCHIECTASIS.—From *βρόγχος* the windpipe, *έκτασις* a stretching out.—Dilatation of the bronchi.

BRONCHOCELE.—From *βρόγχος* the windpipe, *κήλη* swelling.—An inaccurate term for an enlargement of the thyroid gland.

BRONCHOPHONY.—From *βρόγχος* the windpipe, *φωνή* voice.—A distinct, but not loud, sound of the voice heard when the stethoscope is applied to the chest in cases of pneumonia, phthisis, and other consolidations.

BRUIT DE POT FÊLÉ.—Sound of a cracked vessel, heard sometimes on percussing over a cavity in the lung, when it is near the surface and communicates with an open bronchus.

CACHEXIA.—From *κάκος* evil, *ἔξις* habit.—A depraved condition of the body, which is usually the result, and not the cause, of disease.

CARDIALGIA.—From *καρδία* the heart, *άλγος* pain.—A burning pain referred to the stomach. Heartburn.

CASEATION.—From *caseus*, cheese. A pathological process observed in tuberculosis, when the inflammatory product becomes yellow, friable, and dry.

CATAMENIA.—From *κατά* answering to, *μήν* a month.—The menstrual discharge of females.

CATARRH.—From *καταρρέω*, to flow down.—Inflammation of,

and discharge of fluid from, a mucous membrane. Generally used to denote a common cold affecting the nose (Coryza), the frontal sinuses (Gravedo), and trachea and bronchial tubes (Bronchitis).

CATHARTICS.—From *καθαίρω*, to purge.—Medicines which increase the number of intestinal evacuations.

CAVERNOUS RESPIRATION.—From *caverna*, a cave, grotto.—A hollow sound heard during auscultation, in dilated bronchi and diseases causing excavation in the lung tissue. Tracheal respiration.

CHLOASMA.—From *χλωάζω*, to be of a pale light green.—An eruption of light yellowish-brown patches on the chest and abdomen. Dark circles round the eyes.

CHLOROSIS.—From *χλωρός*, green—generally pale, pallid.—Green sickness. Peculiar to young girls suffering from disordered or arrested menstrual flow. There is frequently a green tint of the complexion.

CHOREA.—From *χορεία*, a dancing.—A disease attended with erratic movements, grimaces, twitchings, and gesticulations of an involuntary character.

CIRRHOSIS.—From *κίρρος*, yellow.—An increase of connective tissue in the liver or lungs, which may be so excessive as to absorb or destroy the natural structure by pressure. In cirrhosis of the liver, the pale colour is due to the large amount of yellow pigment in the secreting cells; the liver is also smaller and puckered, producing the hob-nailed condition.

CLONIC.—From *κλόνος*, any violent motion, tumult.—A term applied to convulsive movements in which contractions and relaxations alternate.

CONDYLOMATA, pl. of Condyloma.—From *κόνδυλος*, a knuckle.—Indolent, wart-like protuberances about the genital organs and anus.

CORYMBOSE.—From *κorymbos*, a cluster of fruit or flowers terminating in a flat plane.

CORYZA.—From *κάρω* the head, and *ζέω* to boil.—A mucous, ropy discharge from the nostrils, caused by inflammation of the Schneiderian membrane.

CREPITATION.—From *crepito*, to crackle.—A sound heard in the first stage of pneumonia, prior to consolidation, and in the third stage (resolution). It is also manifest in acute capillary bronchitis and pulmonary cedema.

CUTIS ANSERINA.—*Cutis* skin, *anser* a goose.—A condition of the skin observed in the early stage of fever, and in various nervous affections, and resembling the skin of a plucked goose.

CYANOSIS.—From *κύανος*, blue.—Lividity or duskiness of the face. Observed in affections interfering with the entrance of air into the lungs.

CYNANCHE PAROTIDEA.—From *κύων* a dog, *ἀγχω* to choke;

παρά belonging to, *ὅς* the ear.—Mumps. Inflammation of the parotid gland.

CYSTICERCUS.—From *κύστις* the bladder, *κέρκος* a tail.—A genus of the Entozoa of the family of the hydatids. The tailed bladder-worm.

DESQUAMATION.—From *desquamo*, to scale off.—Separation of the epidermis in the form of scales.

DIABETES.—From *διδά* through, *βαίω* pass.—Great increase of the secretion of urine.

DIAPHORETICS.—From *διδά* through, *φορέω* to carry.—Remedies which promote perspiration.

DIATHESIS.—From *διατίθημι*, to arrange, dispose.—A morbid tendency. A peculiar predisposition to certain diseases.

DIPHTHERIA.—From *διφθέρα*, a skin or membrane.—An epidemic disease of the throat, consisting of the formation of false membranes, which appear on uvula and palate, tonsils and pharynx, extending into pharynx and larynx, and are at first white, but afterwards become darker. These diphtheritic patches separate by sloughing.

DIPSOMANIA.—From *δίψα* thirst, *μανία* rage.—An insatiable desire for alcohol, observed in habitual drunkards.

DIURETICS.—From *διδά* through, *ούρέω* to pass urine.—Medicines which promote an increased flow of urine.

DYSENTERY.—From *δύς* with difficulty, *έντερον* bowel.—Inflammation and ulceration of the mucous membrane of large intestine and rectum, attended with griping and mucous and bloody stools.

DYSPEPSIA.—From *δύς* with difficulty, *πέπτω* or *πέσσω* to soften, digest.—A disordered condition of the functions of the stomach. Indigestion.

DYSPŒA.—From *δύς* with difficulty, *πνέω* to breathe.—Difficult, laboured, obstructed breathing.

ECCHYMOsis.—From *έκχυμώ*, to pour out.—A blue or black discoloration from an extravasation of blood into the areolar tissue.

ECHINOCOCCI.—From *έχινος* hedgehog, *κόκκος* a berry.—Immature tapeworms or hooklets, found in hydatid cysts, most commonly in the liver.

ECTHYMA.—From *έκθύω*, to break out.—Skin disease characterised by large pustules and inflammation of a severe type.

ECZEMA.—From *έκζέω*, to boil up.—An inflammatory disease of the skin, with formation of vesicles, which, from irritation or other causes, may become pustules.

EMBOLISM.—From *έμβόλη*, a wedge or plug.—The obstruction of a blood-vessel by a fibrinous concretion, which has been detached from the heart or one of the vessels.

EMPHYSEMA.—From *έμφυσάω*, to inflate.—1. Infiltration of air into the interlobular areolar tissue. 2. Dilatation of air-cells, which assume the size of hemp-seeds.

EMPHYEMA.—From *ἐν* within, *πύον* pus.—A collection of pus within the cavity of the pleura.

ENCEPHALITIS.—From *ἐγκέφαλος* brain, terminal *-itis*.—Inflammation of the brain and its membranes.

ENDEMIC.—From *ἐν* amongst, *δῆμος* people.—Referring to diseases peculiar to certain localities.

ENDOCARDITIS.—From *ἐνδον* within, *καρδία* the heart, terminal *-itis*.—Inflammation of the membrane which lines the interior of the heart.

EPIDEMIC.—From *ἐπὶ* upon, *δῆμος* people.—Applicable to diseases which attack large numbers simultaneously.

EPILEPSY.—From *ἐπιλαμβάνω*, to seize, attack.—Sudden and complete unconsciousness, with a series of convulsive movements.

ERUCTION.—From *eructo*, to belch.—Expulsion of wind from the stomach by the mouth.

ERYTHEMA.—From *ἐρυθθαίνω*, to redden.—Arises from some derangement of the system, and consists of a mere redness of the skin, not extending to the cellular tissue.

ETIOLOGY.—From *αἰτία* cause, *λόγος* discourse. An account of the causes of disease.

EXACERBATION.—From *exacerbo*, to make angry.—An increase of the strength and fury of the symptoms of a disease.

EXANTHEMATA.—From *ἐξανθέω*, to break out, to bloom.—Diseases of the skin, consisting of an eruption of red patches, which disappear transiently under pressure.

EXOPHTHALMIC GOÏTRE.—From *ἐξ* out, *ὀφθαλμος* the eye.—Protrusion of the eyeball, accompanied by goitre.

EXPECTORANTS.—From *expectoro*, to discharge from the chest.—Medicines which facilitate the removal of secretions collected in the chest.

FEBRIFUGE.—From *febris* fever, *fugo* to drive away.—A medicine which possesses the power of diminishing the severity of fever.

FISTULA—a pipe, tube, reed.—A passage with narrow opening, the result, generally, of ulcer or abscess.

FOMITES, pl. of *fomes*, touchwood, tinder.—Porous substances which absorb and retain contagious effluvia, as woollen clothing, cotton materials, etc.

FREMITUS, murmuring, growling.—Vocal fremitus is a vibration communicated to the hand when placed on the chest whilst the patient is speaking. It is absent or diminished in pleuritic effusion, and increased in pulmonary consolidation.

GASTRALGIA.—From *γαστήρ* stomach, *ἄλγος* pain.—A sensation of pain in the stomach of a burning character.

GASTRODYNIA.—From *γαστήρ* stomach, *ὀδύνη* pain.—Cramp or spasmodic pain in the stomach.

GASTROTOMY.—From *γαστήρ* stomach, *τέμνω* to cut.—The operation of opening the stomach.

GLYCOSURIA. —From γλυκός sweet, οὐρον urine. —Sugar in the urine.

GRAVEDO. —From *gravis*, heavy. —Inflammation of the membrane lining the frontal sinuses.

GUMMATA. —From *gumma*, an elastic tumour containing a substance like gum. —Small, firm, yellow-whitish tumour surrounded by a capsule formed of degenerated tissues. Characteristic of syphilis.

HÆMATEMESIS. —From αἷμα blood, ἐμέω to vomit. —Vomiting of blood from the stomach.

HÆMATINURIA. —From *hæmatin*, the red colouring matter of the blood, οὐρον urine. Dark-coloured urine, containing no blood, but merely the colouring-matter of the blood.

HÆMOPTYSIS. —From αἷμα blood, πτύω to spit. —Bleeding from the lungs.

HÆMORRHAGE. —From αἷμα blood, ῥήγνυμι to break forth. —Bursting forth or discharge of blood.

HEMIPLEGIA. —From ἡμισυς half, πλῆσσω to strike. Paralysis affecting one side of the body.

HEPATISATION. —From ἥπαρ, the liver. —A term applied to the lungs when so inflamed as to be impervious to air, the structure assuming a liver-like appearance.

HERPES. —From ἔρπω, to creep. —A skin disease consisting of small vesicles upon inflamed bases.

HYALINE. —From ὁαλός, glass. —A transparent colourless substance.

HYDATIDS. —From ὕδωρ, water. —Cysts filled with a limpid fluid, floating in which are the immature tapeworms.

HYDRAGOGUES. —From ὕδωρ water, ἀγῶ to expel. —Medicines which cause watery evacuations.

HYDROCEPHALUS. —From ὕδωρ water, κεφαλή the head. —A collection of water within the head.

HYDRONEPHROSIS. —From ὕδωρ water, νεφρός the kidney. —Dropsy of the kidney.

HYDROPHOBIA. —From ὕδωρ water, φοβέω to fear. —Madness caused by the bite of a rabid animal.

HYPERTROPHY. —From ὑπέρ above, increase, τρέφω to nourish. —Excessive growth or enlargement of a part, caused by increase in size or number (or both) of tissue elements.

HYPPOCHONDRIASIS. —From ὑπό under, χόνδρος cartilage. —Morbid sensibility, mental alienation. Probably derives its name from an uneasy feeling experienced in the hypochondriac regions.

HYSTERIA. —From ὑστέρα, the womb. —A nervous disorder confined almost entirely to susceptible females, consisting of a morbid imagination, peculiar deceptions, and amorous excitement.

ICHTHYOSIS. —From ἰχθῦα, skin of a fish. —A hard, dry, scaly, non-contagious, disease of the skin.

IDIOPATHIC.—From *ιδιος*, peculiar, separate.—A spontaneous or primary disease. Not dependent upon another.

IMPETIGO.—From *impeto*, to attack.—A pustular disease of the skin, forming thick yellowish incrustations.

INSOLATIO.—From *in, sol*, the sun.—An affection due to the direct action of the sun's rays—Sunstroke.

INTERSTITIAL.—From *inter* between, *sto* to stand.—By some called fibroid. Pertaining to an increase and hardening of the connective tissue.

INTUSSUSCEPTION.—From *intus* within, *suscipio* to receive.—Introduction of one part of the bowel into another, just as the finger of a glove is pulled within itself.

LARYNGISMUS STRIDULUS.—From *λάρυγγίζω* to bawl, *stridulus* a hissing sound.—Spasm of the muscles of the glottis, usually nocturnal, preventing the entrance of air, and giving rise to hoarse, croupy cough. False croup.

LARYNGITIS.—From *λάρυγξ* the windpipe, terminal *-itis*.—Inflammation of the larynx.

LEUCOCYTHÆMIA.—From *λευκός* white, *κύτος* a cell, *αίμα* blood.—A superabundant development of the colourless corpuscles of the blood. White-cell blood.

LICHEN.—From *λεχήνη* moss.—A skin disease in which the papules are distinct or arranged in clusters. Very irritating and obstinate.

LOCOMOTOR ATAXY.—From *ἀ* neg., *τάσσω* to order.—An absence of co-ordination in the movements of the muscles.

LUPUS.—From *lupus*, the wolf.—A spreading, corroding, tuberculous disease.

LYSIS.—From *λύω*, to dissolve.—The gradual diminution and termination of a fever without critical symptoms.

MACULA.—From the Latin *macula*.—A permanent discoloration of some portion of the skin, sometimes associated with alteration of its texture. It is not dependent on any disease of the constitution.

MARASMUS.—From *μαραινω*, to waste or pine away.—Progressive wasting.

METALLIC TINKLING.—A sound like that caused by striking glass or metal with a pin. A pathognomonic symptom of pneumothorax with effusion.

MENINGITIS.—From *meningium*, terminal *-itis*.—Acute inflammation of the pia mater and arachnoid.

MYALGIA.—From *μῦς* a muscle, *ἄλγος* pain.—Muscular soreness, stiffness, or pain. Cramp.

MYELITIS.—From *μυελός* marrow, terminal *-itis*.—Inflammation of the spinal cord.

NEURALGIA.—From *νεφρός* the kidney, *ἄλγος* pain.—Pain and neuralgia in the kidney.

NEPHRITIS.—From νεφρός, the kidney, terminal *-itis*.—Inflammation of the kidney.

NUMMULAR.—From *nummula*, a little coin.—Applied to sputa lying flat at the bottom of a vessel, and having the appearance of small coins.

EDEMA.—From οίδω, to swell.—Dropsical swelling, from accumulation of serous fluid in subcutaneous areolar tissue.

OIDIUM ALBICANS.—From ὠόν an egg, εἶδος resemblance.—A vegetable parasite, seen on the mucous membrane of cheek and throat as white spots and patches.

OPISTHOTONOS.—From ὀπισθε behind, τενω to stretch.—Spasm of the neck, back, and loins, causing an arch-like appearance of the body.

OXYURIS.—From ὀξύς sharp, οὐρά a tail.—Small thread-worm.

PARACENTESIS.—From παρά by the side, κεντέω to stab.—The operation of removing fluid from a cavity by tapping.

PARALYSIS.—From παραλύω, to relax or disable.—Diminution or total loss of voluntary motion, or sensibility, or of both.

PARAPLEGIA.—From παραπλήσσω to strike partly.—Palsy affecting the lower half of the body.

PARESIS.—From παρίημι, to unloose, relax.—Partial paralysis, consisting of a slight inability of movement.

PATHOGNOMONIC.—From πάθος suffering, sickness, γινώσκω to perceive.—Applied to the distinguishing symptom or symptoms of a disease.

PECTORILOQUY.—From *pectus* the breast, *loquor* to speak.—The sound of the voice heard during auscultation, which appears to be transmitted directly from the chest into the ear.

PERICARDITIS.—From περί about, καρδιά the heart, terminal *-itis*.—Inflammation of the sero-fibrous membrane covering the heart.

PERITONITIS.—From περιτείνω, to stretch all round, terminal *-itis*.—Inflammation of the serous membrane lining the cavity of the abdomen.

PERITYPHLITIS.—From περί around, τυφλός blind, terminal *-itis*.—Inflammation of the areolar tissue which connects the psoas and iliacus muscles with the cæcum.

PETECHIA.—From *petechio*, a flea-bite.—A small red or purplish spot, in shape and colour similar to a flea-bite, and due to subcutaneous hæmorrhage.

PHOTOPHOBIA.—From φώς light, φόβος fear.—Aversion to and intolerance of light. Found in certain stages of meningitis, in measles, typhus, and many diseases of the eye.

PHTHISIS.—From φθίω, to pine or waste away.—Progressive emaciation. Consumption of the lungs. Decline.

PLEURISY, or Pleuritis.—From πλευρά the side, terminal *-itis*.—Inflammation of the serous membrane which lines the walls of the chest, and is reflected upon each lung.

PLEURODYNIA.—From *πλευρά* the side, *ὄδυνη* pain.—Pain seated in the walls of the chest, and ordinarily in the intercostal nerves.

PLEXIMETER.—From *πλήσσω* to stride, *μέτρον* a measure.—An ivory plate used in mediate percussion of the chest.

PNEUMONIA.—From *πνευμονία*, a disease of the lungs.—Acute inflammation of the substance of the lung.

PNEUMOTHORAX.—From *πνεῦμα* air, *θώραξ* the chest.—A collection of air in the pleural cavity. If serum also present, Hydro-pneumothorax; if effusion purulent, Pyopneumothorax.

PODAGRA.—From *πούς* the foot, *ἀγρᾶ* seizure.—Gout situated in the joints of the foot.

PROPHYLACTIC.—From *πρὸ* before, *φυλάσσω* to avoid.—The preventive treatment of disease.

PRURIGO.—From *prurio*, to itch.—A papular eruption, attended with severe itching.

PSORIASIS.—From *ψώρα*, itch, mange.—A disease of the skin characterised by patches of rough scales.

PTOSIS.—From *πτῶω*, to fall.—A falling of or inability to raise the upper eyelid.

PUERPERAL.—From *puer* a child, *pario* to bring forth.—Relating to women recently delivered.

PURPURA.—From *πορφύρα*, the purple fish.—Purple spots and patches on the skin from extravasation, due to a morbid condition of the blood and capillary vessels.

PYÆMIA.—From *πύον* pus, *αἷμα* blood.—Contamination of the blood from absorption of pus.

PYELITIS.—From *πέλος*, a tub, trough, terminal *-itis*.—Inflammation of the pelvis, infundibula, and calyces of the kidney.

PYROSIS.—From *πυρόω*, to burn.—A disease consisting in a hot sensation in the stomach and copious eructation of thin, watery, acid, or insipid fluid.

PYTHOGENIC.—From *πύθω* to rot, *γεννάω* to generate.—A term applied to typhoid, gastric, or enteric fever.

RABIES.—From *rabio*, to be furious.—A disease of dogs and other animals, which, if implanted by means of the saliva into the human system, produces Hydrophobia.

RALES.—From *raler*, to rattle in the throat.—Liquid sounds produced by the air passing through mucous or other fluids.

RESOLVENTS.—From *resolvo*, to relax, undo.—Substances possessing the power of promoting the resolution of tumours.

RHONCHUS.—From *ρήγχο*, a rattling sound in the throat.—*Sonorous* rhonchus is a dry deep-toned sound produced by obstruction to the tide of air in a large bronchial tube. In the smaller tubes the pitch is higher, and whistling, hissing sounds are heard, called *sibilant* rhonchi.

ROSEOLA.—Diminutive of *rosa*, a rose.—An efflorescence of transient patches of redness. Non-contagious.

RUBEOLA.—From *rubeo*, to blush.—A disease combining certain symptoms of scarlatina with symptoms resembling those of measles.

RUPIA.—From *ῥύπος* dirt, uncleanness.—A non-contagious eruptive disease characterised by flat vesicles, which are succeeded by dark and rough crusts.

SARCINA VENTRICULI.—From *σάρκινος*, fleshy.—A microscopic cryptogamous plant, found in the contents of the stomach in pyrosis.

SCABIES.—From *scabo*, to scratch.—A contagious cutaneous disease attended with severe itching.

SCIATICA.—From *ἰσχίον*, the hip.—Pain in the sciatic nerve.

SCLEROSIS.—From *σκληρός*, hard, tough.—An increase of connective tissue, which may destroy the natural structure by pressure.

SCROFULA.—From *scrofa*, a sow.—A morbid state of the system revealed by chronic swelling and suppuration of the absorbent glands, etc.

SEPTICÆMIA.—From *σέπω* to rot, *αἷμα* blood.—Putrid infection. A morbid state of the blood, due to the presence of bacteria, *i.e.* rod-like microscopic bodies.

SEQUELÆ.—From *sequor*, to follow.—Morbid affections left as the result of a disease.

SHINGLES.—From *cingulum*, a girdle.—The popular name for Herpes zoster, a vesicular disease which compasses half the circumference of the body.

STENOSIS.—From *στένω*, to make narrow.—Contraction of a vessel.

STERCORACEOUS.—From *stercus*, excrement.—A term applied to faecal vomiting.

STOMATITIS.—From *στόμα*, a mouth, terminal *-itis*.—Inflammation of the mouth, which may be parasitic, vesicular, ulcerative, or gangrenous.

SUBSULTUS TENDINUM.—From *subsulto*, to leap.—An involuntary twitching of the tendons, generally observable at the wrist. Evidence of great cerebral irritability.

SUDAMINA.—From *sudo*, to sweat.—Small transparent vesicles which appear in numbers upon the skin in diseases accompanied by sweating.

SYCOSIS.—From *σῦκον*, a fig.—An eruption of inflamed tubercles clustering about the beard and scalp. Ringworm of the beard.

SYNCOPE.—From *συνκρίπτω*, to knock to pieces.—Partial or complete suspension of respiration and the action of the heart. Sudden prostration.

SYPHILIS.—From *σύν* with, *φιλέω* to love.—An infectious disease communicable usually during coition.

TABES.—From *tabeo* to decay.—Emaciation, usually the result of tubercular degeneration.

TÆNIA.—From *ταῖα*, a band or ribbon.—The tapeworm.

TENESMUS.—From *τεῖνω*, to stretch, to strain to the utmost.—A painful desire to go to stool, with great straining.

THROMBOSIS.—From *θρόμβος*, a clot of blood.—Partial or complete obstruction of a vessel by a morbid product formed at the occluded spot.

TINEA CIRCINATA.—From *tinea* a gnawing worm, *circinatus* to be compassed about.—A contagious and parasitic disease attacking the general surface of the body, and characterised by rings spreading from a centre.

TINEA DECALVANS.—From *decalvo*, to make bald.—Falling-off of the hair, leaving little circular or oval bald patches.

TINEA FAVOSA.—From *favus*, a honeycomb.—This disease affects the scalp, and the hairs are found to pierce a small, dry, cup-shaped, yellow scab.

TINEA TONSURANS.—From *tondeo*, to shave.—A disease of the scalp, in which are present patches of baldness, with scaly eruption.

TINEA TRICOPHYTINA.—From *θρίξ* the hair, *φυτόν* a vegetable.—A vegetable parasite affecting the scalp, the hairy part of the face, or any portion of the skin.

TINEA VERSICOLOR.—From *verso* to turn, *color* colour.—A vegetable parasitic disease marked by the presence of yellow-coloured patches on the chest and abdomen, and covered with small scales.

TONIC SPASM.—From *τεῖνω*, to stretch.—Referring to rigid contraction of the muscles without relaxation.

TOPHI, pl. of *tophus* or *tofus*, volcanic rock.—Chalk-stones. Concretions of urate of soda with animal matter found in the joints of gouty subjects.

TRICHINA SPIRALIS.—From *θρίξ* a hair, *σπείρα* anything wound round.—A species of entozoa infesting the voluntary muscles.

TUBERCULOSIS.—Diminutive of *tuber*, elevation or excrescence.—A morbid condition distinguished by small nodular lesions found in the organs and tissues.

TYMPANITES.—From *τύμπανον*, a drum.—Accumulation of wind in the bowels, marked by spherical projection of the abdomen, and increased resonance on percussion.

TYPHLITIS.—From *τυφλός*, blind; terminal *-itis*.—Inflammation of the cæcum.

TYPHOID.—From *τύφω* to make dull or restless, *είδος* resemblance.—A slightly contagious fever generated by decomposed animal matter, and distinguished by increased vascularity of Peyer's glands, followed by ulceration.

TYPHUS.—From *τύφω* to make dull or restless (or *τύφος*

smoke).—A continued contagious fever marked by great prostration and mental disturbance.

URÆMIA.—From *urea*, *αὔρα* blood.—A condition of urea in the blood, which acts as a poison to the nervous centres.

URTICARIA.—From *urtica*, a nettle.—An affection distinguished by an eruption of wheals, resembling the elevations produced on the skin by the stings of nettles.

VARICELLA, chicken-pox.—Diminutive of *variola*.—A mild eruptive disorder characterised by transparent vesicles of the size of a pea, and appearing in successive crops.

VARIOLA.—From *varius*, spotted.—A contagious disease marked by fever and an eruption passing through papular, vesicular, and pustular stages. Upon shrinking of the pustules scabs are formed. Small-pox.

VIBICES, pl. of *vibex*, the mark of a stripe.—Large purple spots appearing under the skin, and found in purpura, scurvy, small-pox, typhus, and hepatic and splenic diseases.

ZYMOTIC.—From *ζύμη*, leaven, yeast.—Zymotic diseases are those which depend on some morbid poison acting on the organism in the manner of a ferment. They are contagious, febrile in character, and rarely attack the same person more than once. Zymotic diseases are—small-pox, chicken-pox, typhus fever, typhoid fever, scarlet fever, the plague, measles, hooping-cough, and mumps.

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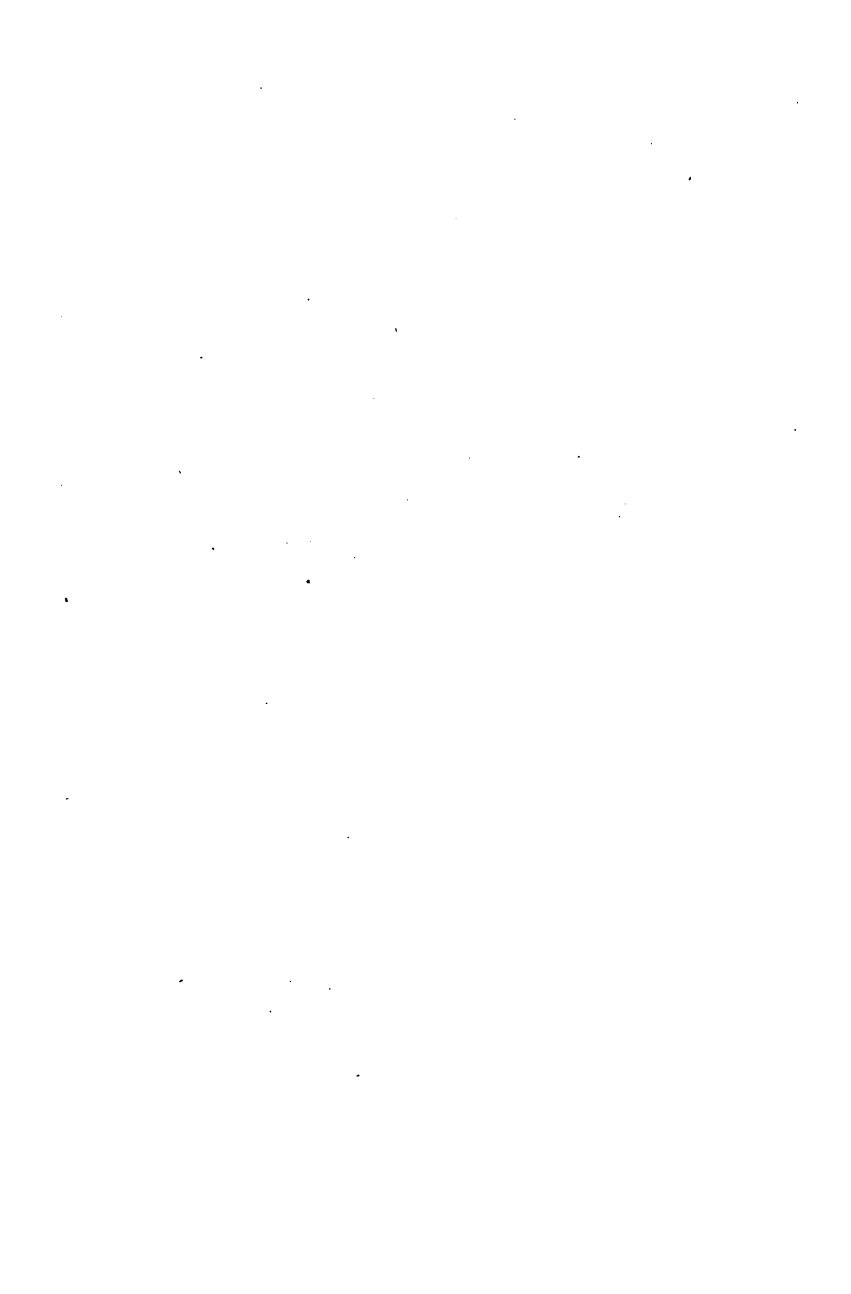
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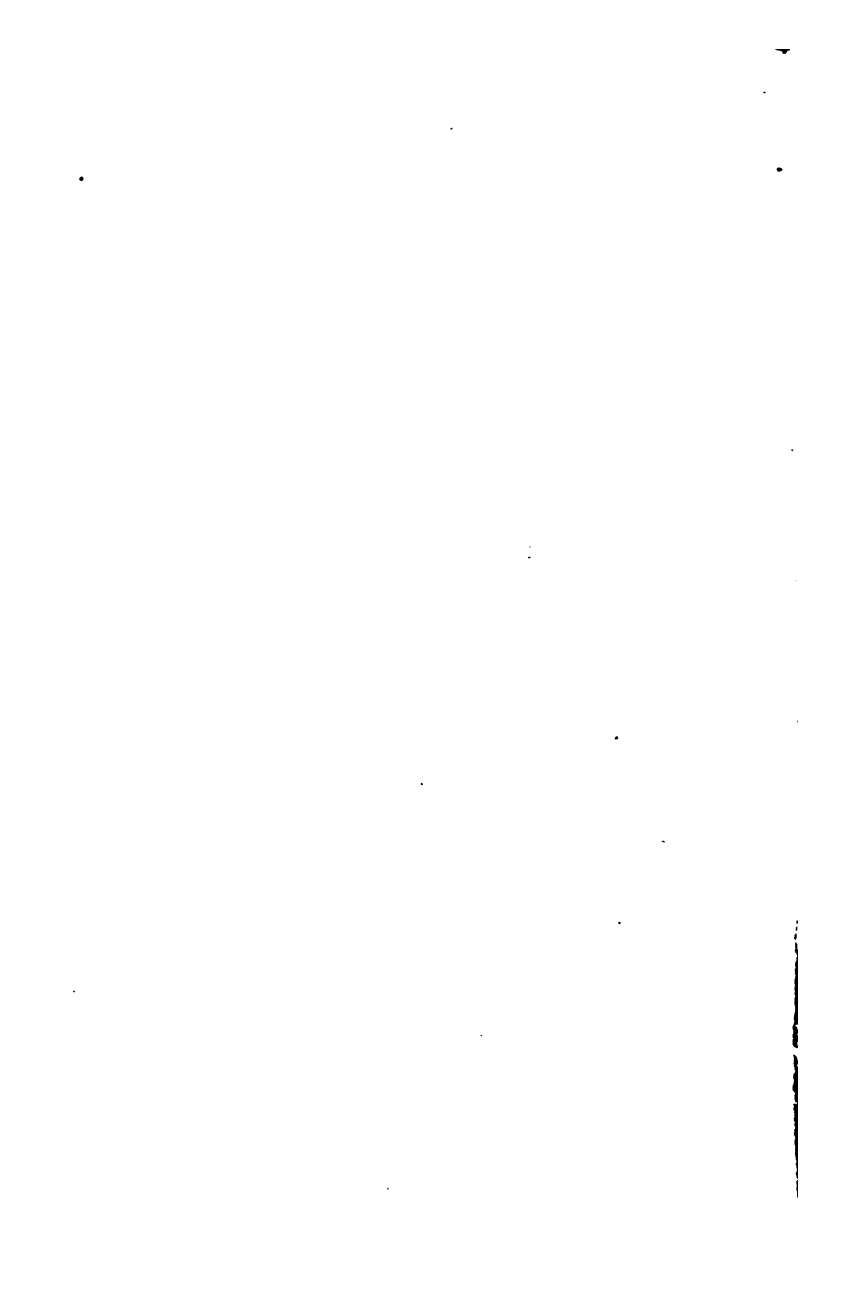
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